



PEGASUS RISES
BOEING FUELS US
TANKER RENEWAL
AS KC-46A SOARS
DEFENCE P17

FALLEN STAR

American Airlines ditching
Zodiac is uncomfortable
sign of pressure facing
global supply chain **11**

SHAPING UP

Could Seattle plump for
elliptical fuselage design
to help gap-filling 7M7
go the distance? **14**

FLIGHT

INTERNATIONAL

From  Flightglobal

6-12 OCTOBER 2015

UNMANNED SYSTEMS

HOW TO FLY THE REAPER

We go behind the scenes at Holloman as
US MQ-9 training programme gathers pace



£3.50



Farnborough International Airshow

\$204 Billion

of orders and commitments placed

\$76bn

MRO projected to
grow to by 2023



CIVIL AVIATION	BUSINESS AVIATION	DEFENCE
SPACE	ROTARY WING	UAS
MNFACT TECH	MRO	FUTURES

The Farnborough International Airshow created a record breaking US\$204 billion in total orders in 2014. With 20% of our exhibitors operating within MRO and growing show on show, there has never been a better time to participate.

Contact us today and discover how we can be the best for your business.



11-17 July 2016

farnborough.com

We're the best for your business!



US Air Force/Rea. Shutterstock

COVER IMAGE

One of the US Air Force's armed MQ-9 Reapers flies a combat mission over Afghanistan earlier this year. We visit the service's main training school **P26**



BEHIND THE HEADLINES

For our special report about unmanned systems training, **Beth Stevenson** got to grips with the CAE-delivered set-up for the remotely piloted **MQ-1 Predator** and **MQ-9 Reaper**, located at the US Air Force's **Holloman AFB** facility in New Mexico (**P26**)



NEXT WEEK SOUTH KOREA

Ahead of the ADEX show, our country special includes an update on Seoul's ambitious KF-X fighter programme

NEWS

THIS WEEK

- 6** Moscow turns up the heat in Syria
- 7** Seoul left in limbo by turboprop flop. Sierra Nevada confirms timelines for Turkish jet
- 8** MQ-9 pitched for UK maritime mission. Boeing seeking cure for composite headaches
- 9** Turbomeca nears 'sleep mode' trials

AIR TRANSPORT

- 10** Airprox glider was 'not visible' to 737. Fans prove a burden for beleaguered Brandenburg
- 11** Interiors pinchpoint warning. Ryukyu is first in the Q for new Bombardier combi. Boeing converts freighter interest, but no launch yet
- 12** Boeing unruffled by Ex-Im impasse. First MC-21 stabiliser set for testing

DEFENCE

- 16** US Army engine battle spools up. Atlas proves strength during Stryker assessment
- 17** KC-46A debut fuels USAF's ambitions. Sagem Patroller on offer to Egyptian armed forces
- 19** Canada extends fixed-wing search. USAF ready to release its Liberty fleet

BUSINESS AVIATION

- 22** \$10m lift for TriFan design. Empire Aviation gains reach with San Marino base. Ultra-light model to join Russian Helicopters fleet
- 23** Funding bankrolls Wheels Up growth. Domestic MRO provider to propel China business. Bright future for 787 shade maker

NEWS FOCUS

- 13** Bumpy road ahead for aviation cycle
- 14** Analysts bank on elliptical fuselage for 7M7 proposal
- 20** Growing UAV use leads services to study capabilities



Air Beamimages

Analysts predicting elliptical fuselage for Boeing **P14**

COVER STORY

- 26 Distance learning** Reapers and Predators prowl the skies over US bases in New Mexico and Nevada, as personnel from several nations are trained to operate the unmanned aircraft

FEATURES

- 30 UNMANNED SYSTEMS Fear of Flyers** As UAVs prove their worth in civil applications – and feature in a growing list of incidents – it's no surprise to find rising demand for formal operator training

REGULARS

- 5 Comment**
- 33 Straight & Level**
- 34 Letters**
- 36 Classified**
- 39 Jobs**
- 43 Working Week**



US Army/Crown Copyright

US Army seeks new engine for helicopters **P16**. UK armed forces explore military applications of UAVs **P20**



CAE offers training centres, training services, and simulation products for helicopters.

Download the Military Simulator Census online now.
www.flightglobal.com/milisim



IMAGE OF THE WEEK

A Royal Australian Air Force Airbus Defence & Space KC-30A multi-role tanker transport has refuelled a Lockheed Martin F-35A for the first time. The 4h sortie took place from Edwards AFB in California, and saw the KC-30A perform 59 boom contacts, including five in which fuel was transferred

View more great aviation shots online and in our weekly tablet edition:



flightglobal.com/
flight-international



US Air Force

THE WEEK IN NUMBERS

50%

Flightglobal dashboard

ST Aerospace bought out joint venture partner Messier-Bugatti-Dowty's half of MRO outfit S-PRO for \$5.7 million

\$1.18bn

Boeing

Value of new five-year contract with Boeing to extend ISS engineering support for NASA until 30 September 2020

10

European Space Agency

The number of Europe's Galileo navigation satellites now in operational orbit; numbers 11 and 12 launch in December

QUESTION OF THE WEEK

Last week, we asked: **As Norway's first JSF emerges, the nation is:** You said:

67%

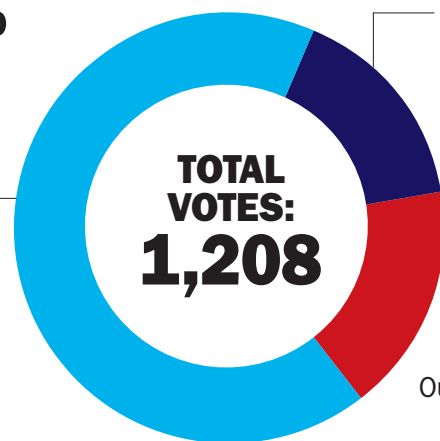
Right to keep faith with F-35

16%

Buying the wrong aircraft

17%

Outnumbered by Russia either way



This week, we ask: **If Boeing launches a 7M7, its design will be:**
☐ Another circular fuselage ☐ Radically elliptical ☐ Mildly different

Vote at flightglobal.com



dashboard

Flightglobal's premium news and data service delivers breaking air transport stories with profiles, schedules, and fleet, financial and traffic information flightglobal.com/dashboard

Download the latest Commercial Engines Report
now with further enhanced data and in-depth market analysis

flightglobal.com/commengines



The Power of Flight

Ankara's away

Development of next-generation turboprops by both new and established players appeared to be all the rage just a few years ago, yet the field has narrowed to China, and now Turkey too

Only two years ago it was possible to imagine a renaissance of regional turboprop manufacturing and innovation not seen since the mid-1960s. Five separate efforts to produce a new aircraft with 70-90 seats were in various stages of early development.

Now just one project – China's initially 70-seat Xian Aircraft MA700 – remains active. India's Hindustan Aeronautics/National Aerospace Laboratory RTA-70 is not publicly canned, but neither is it any further along since its 2007 launch.

Bombardier is no longer in any financial position to move forward on a 90-seat version of the Q400. And ATR's 90-seat project – once so promising – has been scuppered by resistance from the Airbus half of the joint venture.

Finally comes the confirmation that the last of those five projects is no more. Although South Korean firms KAI and KAL-ASD never warmed to the idea, Seoul's

The absence of a 90-seat turboprop is still a curious example of market failure

administration pursued a 90-seat development project for several years with great fervour. But the project was quietly shelved a year ago.

It would be easy to assign blame for the disappearance of the 90-seat turboprop to pure market forces. A new era of collapsing fuel prices diminishes the urgency for launching a fuel-efficient turboprop into a market dominated by regional jets.

But the absence of a successful 90-seat turboprop is still a curious example of market failure. Natural upgauging forces have pushed regional jets from 50 to be-



Difficult without instructions

yond 110 seats in the last 20 years. A modern turboprop larger than the Q400 or ATR 72-600 is long overdue.

The market, however, has failed. Bombardier and ATR should be in a position to respond, but the former's finances and the latter's internal feuding prevent a product launch. Meanwhile, the enormous barriers to entry leave solely state-owned firms in a position to break in. In the last 46 years, only Embraer has navigated that path to market success, leading to a curious lack of supply despite clear demand.

A new, albeit less ambitious, project is rising in Turkey, however. It mainly revolves around reviving the jet-powered Dornier 328 and 628 programmes, but includes turboprops too. It combines the expertise of US-based Sierra Nevada with two state-owned Turkish firms.

It represents a new hybrid model for the aerospace industry, a globalised partnership of the private and public sectors. It may or may not prove more successful, but hopefully it can work. The industry clearly needs new ideas. ■

See This Week P7

Work in progress

Unmanned aircraft are the future of aviation, or so we are led to believe – not least because of their endurance, and the access they offer to some areas that cannot be reached by manned flight.

It is generally accepted that they will complement the work currently carried out by manned aircraft, as well as facilitate moves into new markets.

But this is easier said than done. Associated privacy and airspace integration issues aside, even once unmanned air vehicles are integrated into military arenas, there are still aspects that need to be worked on for them to match their manned equivalents.

Take the UK military. Aside from the Royal Air Force's relatively advanced experience, the Royal Navy

and British Army are still only just finding their feet. For the navy, the sensor on the Insitu ScanEagle isn't up to scratch, as it is missing a robust "find" function to narrow a search, but it has been integrated relatively easily into ship-based operations. But the army's experience with the Thales Watchkeeper is reversed – it has a top-notch sensor, but reaching full operational capability is proving challenging, even after what has been a delayed release to service process.

As one military representative noted last week, "it isn't all rosy", but embracing this disruptive technology and learning from it is ultimately going to be more advantageous than turning and running. ■

See News Focus P20



Keep up to speed with more of aerospace's top stories on our premium industry news site: flightglobal.com/dashboard



BRIEFING

UKRAINE, RUSSIA TRADE FLIGHT RESTRICTIONS

DISPUTE Russian airlines will be refused permits to fly to Ukrainian cities from 25 October, the state aviation administration in Kiev says. The prohibition will primarily affect Aeroflot and Transaero, although Flightglobal's Innovata schedules database shows S7 Airlines and UTair as also currently operating services to the Ukrainian capital. In response, Moscow's federal aviation regulator has handed airspace bans to five Ukrainian carriers with services or permission to fly Russian routes.

MITSUBISHI SETS LATE-OCTOBER TARGET FOR MRJ

PROGRAMME Mitsubishi Aircraft has earmarked the week of 26 October for the first flight of its developmental Mitsubishi Regional Jet. The manufacturer will announce the exact date 24h in advance, with the MRJ to make a 1h debut sortie from Tokyo's Nagoya airport.

CARGOLUX WEIGHS FREIGHTER INCREASE

PLANS Luxembourg-based Cargolux could acquire more freighters to equip a new joint venture created with Chinese part-owner Henan Civil Aviation & Investment. "We are currently looking at different possibilities," it says, and a decision on whether to acquire new or used aircraft "might be taken early next year." Cargolux in late September took delivery of its 13th Boeing 747-8F, and additional examples could potentially equip its future operation in Zhengzhou.

CHILE SIGNS UP FOR VULCANAIR FLEET

CONTRACT Vulcanair is to provide Chile with seven P68 Observer 2 aircraft configured for tasks including transport, search and rescue, reconnaissance and medical evacuation, for operation by its navy and maritime police. Deliveries of the twin-engined type will occur "during the course of 2016-2017", the Italian manufacturer says.

SCANEAGLE SECURES NEW BUYERS

ORDERS Insitu has been awarded a trio of Foreign Military Sales contracts to supply ScanEagle unmanned air vehicles to Cameroon, Kenya and Pakistan. Announced by the US Department of Defense and worth a combined \$34 million, the transactions cover UAVs and related equipment to be delivered by September 2016.

SECOND MD902 FOR LONDON'S AIR AMBULANCE

ADDITION London's Air Ambulance has confirmed its purchase of a second MD Helicopters MD902 to support its emergency medical services work. Registered as G-LNDN, the aircraft "is expected to be operational in early 2016", said the charity. Built in 2008 and originally operated by Qatar-based Gulf Helicopters, this will join its existing Explorer, G-EHMS, which has been in use since 2000.

ENGINE SUPPORT CENTRE TO POWER DOWN

CLOSURE Fort Worth-based maintenance, repair and overhaul firm Texas Aero Engine Services will close by January 2016, due to falling demand caused by 50% owner American Airlines' phased retirement of the Boeing 757. "Declining future volumes of overhauls for Trent 800 and RB211 will no longer support a commercially viable operation," says Rolls-Royce, which holds the remaining stake.

SENTINEL TO STAY ON WATCH FOR UK

OPERATIONS Royal Air Force Raytheon Sentinel R1 surveillance aircraft will continue to be deployed in support of operations over Iraq and Syria until 2016, defence secretary Michael Fallon says.



AirTeamImages

DELIVERY

Italy set to receive first G550 AEW

The Italian air force's first of two Gulfstream G550 business jets to undergo modification to an airborne early warning (AEW) and control system configuration appears set for delivery. Carrying a temporary US registration, the aircraft was flown from Gulfstream's Savannah facility in Georgia to Tel Aviv, via a 30 September stop at Shannon airport in Ireland. Israel Aerospace Industries' Elta Systems business unit is responsible for integrating the type's AEW radars and other mission equipment. Italy, which ordered its new aircraft in July 2012, will follow Israel and Singapore in operating the AEW-adapted G550. Flightglobal's Fleets Analyzer database records its lead example as due for delivery on 15 October.

CONFLICT ARIE EGOZI TEL AVIV

Moscow turns up the heat in Syria

Russian strike aircraft begin campaign against rebel forces

Russian air force strike aircraft began to attack rebel camps in Syria on 30 September, roughly 1h after Moscow informed the USA and Israel of its intention to launch offensive action against anti-government forces.

The strikes followed an intensive build-up over several weeks at Syria's Latakia air base. This had seen the arrival of Russian air force assets including Ilyushin Il-76 transports, Sukhoi Su-25, Su-30 and Su-34 combat aircraft and attack and utility helicopters including Mil Mi-24 gunships. Hardware, including anti-aircraft systems, has also been deployed to protect Moscow's inventory.

Targeting activities have been assisted by Ilyushin Il-20M intelligence-gathering aircraft, which are being used to co-ordinate attacks, and to follow the movements of other militaries operating aircraft nearby.

The heavily-adapted type's

mission equipment includes surveillance radars, an electro-optical/infrared sensor and satellite communications equipment for real-time data sharing.

Israeli sources describe the new air activity over Syria as a "recipe for trouble", and note that Russia's aircraft began their involvement by bombing targets near Homs and Hama – both areas over which US aircraft are being flown on an almost daily basis.

In an attempt to deconflict its activities with those now being mounted by Russian aircraft, the US Department of Defense had, on 29 September, announced opening "lines of communication" with Moscow.

This process – a similar example of which had been established between Russia and Israel's defence ministry – is intended to "avoid any inadvertent incidents over Syrian air space", US defense secretary Ash Carter says. ■



MQ-9 pitched for UK maritime mission
THIS WEEK P8

MANUFACTURING GREG WALDRON SINGAPORE

Seoul left in limbo by turboprop flop

South Korea has quietly cancelled an indigenous regional aircraft programme after its failure to attract a foreign partner

Failure to attract a foreign partner led South Korea to abandon its project for an indigenous 90-seat turboprop, ending the country's decades-old ambition to develop a civil airliner manufacturing industry.

Sources close to the cancelled programme say the team within Korea Aerospace Industries (KAI) that was working on development was quietly disbanded in 2014. Korean Air's aerospace manufacturing division KAL-ASD had also

been involved in the project.

"Both KAI and KAL-ASD were never in favour of the programme, but since the Ministry of Trade, Industry and Energy controls KAI and also part of the KAL-ASD research and development department, the two companies had little choice but to get into it – albeit with only one foot," says one source. "It was finally terminated last year."

The proposed programme went through a number of iterations

after its initial conception in the mid-1990s as a twin-engined regional jet. An early plan called for Seoul to partner with China, but this fell through because Beijing wanted a majority interest in the programme and the main role in final assembly.

Subsequently, Chinese airframer Comac went on to develop its own ARJ21 regional airliner.

In the 2000s, the Korea Aerospace Research Institute (KARI) proposed the concept of a

90-seat turboprop airliner to the government, leading to KAI's involvement in the programme.

KARI's broad concept was to update the Bombardier Q400. It believed that it could increase the aircraft's speed by narrowing its fuselage, while also raising capacity and reducing noise levels.

As of early 2013, Bombardier was in talks with three potential South Korean partners to jointly develop a 90-seat turboprop, although a deal was never signed. ■



A second Leap 1A-powered A320neo has entered flight testing

PROGRAMME STEPHEN TRIMBLE WASHINGTON DC

Airbus uncovers fresh damage to GTF engine

Airbus has found fresh damage to one of the Pratt & Whitney PW1100G engines on an A320neo flight-test aircraft after hot weather evaluations, but maintains plans to deliver the first customer aircraft this year are unchanged. The affected aircraft, MSN6101, is grounded, but Airbus is "confident" it will be returned to flight soon.

It had completed a hot weather test campaign shortly before the damage in the engine was detected, Airbus says. P&W is analysing the extent of the damage.

A handover to launch customer Qatar Airways is planned for the final quarter. "Our plans to start the A320neo delivery stream in 2015 remain unchanged," Airbus says. The incident follows a manufacturing problem with a com-

bustor seal last May that grounded the PW1100G-powered test fleet for more than three months.

It had restored one of the two PW1100G-equipped Neos to flight status in July, but the other only started flying again in September.

Meanwhile, the airframer has introduced the second CFM International Leap 1A-powered A320neo into the type's flight-test campaign. The aircraft (D-AVVB) performed its maiden flight on 29 September, from Hamburg to Toulouse, Airbus confirms.

Additionally, in late September it began function and reliability tests on a customer aircraft, MSN6720, an airframe destined to be handed to Indian budget operator IndiGo. ■

Additional reporting by David Kaminski-Morrow in London

DEVELOPMENT STEPHEN TRIMBLE WASHINGTON DC

Sierra Nevada confirms timelines for Turkish jet

The proposed 30-seat regional jet designed for Turkey's commercial market will fly by 2019 and a stretched 70-seat version will fly in 2023, manufacturer Sierra Nevada has announced, underscoring the timelines for the project revealed at the Paris air show in June.

Fatih Ozmen, speaking at the American Turkish Council Conference in Washington DC on 29 September, said the aircraft will "help change the face of transportation in Turkey."

Sierra Nevada and Turkish firms led by STM have partnered to modernise the Dornier 328 Jet and relaunch production in Turkey as the TRJ328.

A larger clean-sheet jet, the TRJ628, will follow with the dis-

tinction of being "fully designed and manufactured by Turkish engineers", Ozmen says.

Once the partnership contract receives "final approvals", a manufacturing facility will be built in Ankara, he says.

Launching the programme in May, two turboprop-powered types were also mooted, the modernised T328 and clean-sheet TR628. Although Ozmen did not specifically refer to these variants in his speech, the company insists that both types remain a core part of the project.

An initial tentative commitment for 50 examples of the TRJ328 has been struck with the Turkish government, but the turboprop model has yet to attract a customer. ■



First flight of the 70-seat TRJ628 is scheduled for 2023

INCIDENT DAVID KAMINSKI-MORROW LONDON

Stricken Q400 had left ground

German investigators have disclosed that the Luxair Bombardier Q400 involved in a take-off accident at Saarbrücken had become airborne before descending back to the ground with its gear retracted.

The aircraft had been departing runway 09, which has a length of almost 2,000m (6,560ft), when the accident occurred on 30 September as it took off for Luxembourg as flight LG9569.

German accident investigation authority BFU says the aircraft left the ground and subsequently came down on its lower fuselage with its landing-gear retracted.

The condition of the powerplants – the type is fitted with Pratt & Whitney Canada PW150s – as well as the deployment status of the flaps and the aircraft's airspeed at the time have yet to be established, the authority adds.

However, the cockpit-voice and flight-data recorders have



Landing-gear was retracted

been secured. Investigators conducted initial interviews with the crew on the day of the incident, with a more detailed assessment of their recollections following in the subsequent days.

Flightglobal's Fleets Analyzer database lists the Q400 (LX-LGH) as a three-year-old airframe. There were no injuries to the 20 occupants during the accident and evacuation. ■

MANUFACTURING STEPHEN TRIMBLE NEW YORK

Boeing seeking cure for composite headaches

Boeing's next innovation in composites could render autoclaves obsolete, Boeing chairman Jim McNerney claims.

The epoxy resin within the composite structures that make up the fuselage of the 787 and the wings of the 787 and 777X have to be cured in autoclaves. This time-consuming and costly process has made it difficult for the airframer to progressively lower the manufacturing cost of the 787 as it approaches four years from entry into service.

But Boeing is already evaluating new kinds of composite materials that do not need to be cured inside autoclaves, McNerney says. "There are new composite matrixes we're looking at that take cost and weight down significantly, [and are] non-autoclavable," McNerney

said at an event in New York.

McNerney did not provide details, but the approach sounds similar to a patented Boeing process known as controlled atmospheric pressure resin infusion (CAPRI), in which dry composite fibre is infused with epoxy resin in a vacuum-assisted procedure.

The next evolution of out-of-autoclave material could set a new landmark in the transition from metal to composite structures in aviation. Composite materials have made it possible to reduce airframe weight while improving strength, but usually at the expense of manufacturing cost, speed and simplicity.

"As far as the eye can see, there are costs and capability improvements in the land of composites," McNerney says. ■

UNMANNED SYSTEMS BETH STEVENSON RNAS CULDROSE

MQ-9 pitched for UK maritime mission

General Atomics modifies Guardian platform with sonobuoy capability and plans flight evaluations of system next year

Manufacturer General Atomics Aeronautical Systems has introduced a new sonobuoy capability for its MQ-9 Guardian unmanned air vehicle, which it believes could make it a contender to help fill the UK's maritime patrol aircraft (MPA) gap.

The concept was presented at the Royal Navy's maritime awareness conference at RNAS Culdrose in Cornwall on 24 September, with an artist's rendering showing a maritime UAV deploying a number of sonobuoys from pods installed beneath its wing.

While the UK government has yet to issue a requirement, the developments that General Atomics is incorporating into the MQ-9 suggests that it will look to offer a modified Guardian to complement a manned MPA.

"What we're really looking at is a Predator B carrying sono-



Underwater sensors would be deployed from wing-mounted pods

buoys, controlling them, and sending sonobuoy information back to the ground station over a SATCOM link," says Jonny King, director for General Atomics' UK division. The new capability has been developed alongside UK supplier Ultra Electronics over two years and has undergone

laboratory and ground testing, he adds. Evaluation flights are planned for early 2016, and will involve flying the UAV over sonobuoy emulators on land, and sending data over the satellite communications link to an acoustic receiver on the ground.

In 2012, General Atomics

worked with Selex to integrate the latter's Seaspray 7500E active electronically scanned array radar onto the MQ-9, and maritime AIS and identification friend-or-foe transponders can also be added.

Additional developments could include the installation of extended-range wings with winglets, and external fuel tanks – a combination which has just been fielded by the US Air Force for the first time.

General Atomics says its Guardian design can fly 1,000nm (1,850km) and then remain on station for a further 10h, while the extended-range variant could match this endurance after being flown a distance of 1,900nm.

The UK Royal Air Force's current Reaper airframes could be re-roled for a maritime mission in around 12h, says King. ■

See News Focus P20



Airprox glider was
'not visible' to 737
AIR TRANSPORT P10

THIS WEEK

PROPULSION DOMINIC PERRY LONDON

Turbomeca nears 'sleep mode' trials

Manufacturer developing system to idle one powerplant on twin-engined helicopters as potential fuel-saving measure

Test flights of a new system allowing twin-engined helicopters to operate using just one powerplant, as a fuel-saving measure, could take place within months, according to French turboshaft manufacturer Turbomeca.

Airbus Helicopters this year unveiled a similar initiative using Pratt & Whitney Canada PW206B engines on its Bluecopter eco-demonstrator, which it refers to as a single-engine operation (SEO). The airframer claimed the system could offer a fuel saving of around 25%. However, Turbomeca is working on its own initiative to

allow one engine to be put into "sleep mode" during suitable stages of flight, says Philippe Couteaux, executive vice-president for strategy and development at the Bordes-based firm.

Although dismissive of Airbus Helicopters' claims of double-digit fuel savings in real-world conditions – due to a relatively limited proportion of flights when SEO could be employed – Turbomeca is developing a system "because we believe there's a potential benefit for certain missions on certain aircraft." Key to its success is the ability to "restart, with full relia-



Airbus Helicopters

Airbus Helicopters has trialled a similar system on its Bluecopter

bility, as quickly as possible" the idled engine, says Couteaux.

Turbomeca has, since June, been testing an electric restart system on what it describes as a 2,500shp-class (1,860kW) engine, likely to be a Makila model.

No results have been released, but Couteaux says the demonstrations have proved it to be "several times faster than any conventional starting device." Couteaux says the company has proposed the concept to the major airframers,

with a view to moving to a flight-test phase, adding: "We are discussing with our customers. All have expressed interest. There's not a specific timeframe, but it is months rather than years."

The ideal helicopter would be a larger model, he says, due to more opportunities to employ the system on flights with longer cruise segments. Of the rotorcraft in production, only the Airbus Helicopters AS332 and H225 use the Makila engine. ■



Delivering the difference

Ruslan International, the British heavy air cargo charter specialists, manages the world's largest fleet of 17 Antonov An-124-100 'Ruslan' freighters.

Offering an unrivalled service for project cargo, we are capable of rising to any outsize or heavy air cargo challenge, safely and in the fastest possible time.

T: +44 (0) 1279 682100
F: +44 (0) 1279 681139
E: sales@ruslanint.com
www.ruslanint.com



RUSLAN International



Image: Curtis Noble Photography



SAFETY DAVID KAMINSKI-MORROW LONDON

Airprox glider was 'not visible' to 737

Captain of narrowbody forced to initiate evasive manoeuvre to avoid collision with unidentified aircraft near Nuremberg

German investigators have de-tailed a serious airprox incident in which a Boeing 737-800 encountered a glider which did not have an active transponder.

Lack of transponder signals meant the glider was "not visible" to air traffic control, nor could it be detected by the 737's collision-avoidance system, in-

vestigation authority BFU states.

The 737 had been descending towards Nuremberg in daylight, following a service from Antalya, on 14 May this year. Weather conditions and visibility were good. BFU says Munich radar controllers cleared the aircraft to descend to 6,000ft but that, some 30s later, the crew reported the



The flight details released match those of an Air Berlin service

encounter with a glider.

After seeing the glider, the 737's captain disengaged the autopilot and initiated an evasive manoeuvre – turning right from 300° to 308° – and stopping the descent at 6,200ft. The captain

believed the two aircraft had been on a collision course.

The glider passed under the 737's left wing. BFU says the aircraft were separated by 330-500ft horizontally and about 150-200ft vertically. It states that "no radar target" could be attributed to the glider during analysis of surveillance data, and neither the glider nor its pilot could subsequently be identified.

BFU states that the 737 had 119 people on board. While it has not disclosed the identity of the operator, BFU's details on the flight data match those of an Air Berlin service on approach to Nuremberg from Antalya at the time of the event. ■

INVESTIGATION ELLIS TAYLOR SINGAPORE

'Sizeable' unmanned air vehicle passed close to ANZ A320

New Zealand's Civil Aviation Authority is investigating a near-miss involving an Air New Zealand Airbus A320 and an unmanned air vehicle.

The incident occurred at around 17:45 on 25 September, as the narrowbody was climbing out of Christchurch while operating a flight

to Auckland. The CAA says, as the aircraft passed through 6,000ft around the Kaiapoi area in controlled airspace, a "sizeable" UAV passed close to it. "We are very concerned [a UAV] pilot appears to have allowed their aircraft to fly in such close proximity to a passenger aircraft," says

CAA director Graeme Harris. "It should not have been anywhere near the jet. It shouldn't have been in that airspace." New Zealand implemented civil aviation rules relating to the use of UAVs in 2014, specifying limitations on where they can be operated and under what conditions. ■

INFRASTRUCTURE MICHAEL GUBISCH LONDON

Fans prove a burden for beleaguered Brandenburg

Berlin's airport operator FBB expects to uncover more building errors from earlier construction phases as it works to complete the troubled Brandenburg hub, after work was suspended due to overloaded structures in the main terminal roof.

"I am sure we will, in future, come across other processes from the past which appear inconceivable at first," says FBB's chief executive Karsten Mühlenfeld.

"We need to bring the mistakes from the past to daylight in order to realise the airport's opening."

On 21 September, a local building authority ordered an immediate halt to work in all areas directly covered by the main terminal's roof, as five of 15 smoke extraction fans installed in the roof structure turned out to be much heavier than previously realised.



Berlin's troubled hub airport was meant to open in June 2012

Construction engineers assumed in their original roof-load calculations that all fans would be identical, says FBB. But while 10 fans weigh 2.3t (5,070lb) each, more powerful units weighing around 4t were fitted in the remaining positions.

The discrepancy was discovered during preparations for the installation of chimneys for the

smoke extraction system, prompting the operator to recalculate the roof structure's requirements.

FBB says the five fans in question do not exceed load limitations of the roof structure. But it acknowledges the steel platforms on which the fans were installed, and which are suspended from the roof, are "under-dimensioned from today's point of view".

The airport operator categorises the mishap as an "inherited" issue because the fans were installed before 2012, when the hub's planned opening was postponed weeks before operations were meant to start in June that year.

State prosecutors in the city of Cottbus are determining why the heavier fans were installed, with FBB saying it "fully" supports the city's investigation.

"There is no question we are at present in a difficult project phase," says Mühlenfeld. He adds management will "continue the chosen path without compromise" and put Brandenburg airport on a "reliable basis" in terms of building regulations.

Brandenburg is scheduled to open in 2017, although Mühlenfeld has said FBB will not hit its target for finishing all construction work by March 2016. ■



Boeing unruffled by
Ex-lm impasse
AIR TRANSPORT P12

FLEET ELLIS TAYLOR SINGAPORE

Ryukyu is first in the Q for new Bombardier combi

Japanese carrier Ryukyu Air Commuter has been identified as the launch customer for the Bombardier Q400 cargo-combi variant unveiled in July 2014.

Bombardier says the carrier is behind the previously announced order for five Q400s.

The transaction is valued at \$168 million at list prices.

The Canadian airframer says the combi variant will be available in various configurations, allowing the carriage of around 4t of cargo and up to 58 passengers.

"The Q400 combi aircraft provides unique opportunities for airlines operating routes with medium to low passenger loads, but with high cargo potential," says Fred Cromer, president of Bombardier Commercial Aircraft.

"Along with the recently launched dual-class and extra capacity options, the combi illustrates Bombardier's ongoing investment in the Q400 aircraft programme and offers airlines unmatched operational flexibility in short-haul markets." ■



Japanese carrier will take five examples of the turboprop variant

SUPPLY CHAIN JON HEMMERDINGER WASHINGTON DC

Interiors pinchpoint warning

Suppliers struggling to cope with demand for products as airlines upgrade, caution analysts

As American Airlines seeks to sever ties with seat manufacturer Zodiac Aerospace on the back of delivery delays, industry consultants warn that the problem could be a sign of things to come as interiors suppliers struggle with an unprecedented ramp-up and shorter product cycles.

"Airlines are putting new demand on those companies," says Fred Cleveland, managing director of PwC's transportation and logistics practice. "There will be a bottleneck at some point."

That point may already have arrived. Fort Worth-based American confirms it "has started looking for a new vendor to supply business-class seats" for its Boeing 787-9s and 777-200s.

"Zodiac has not been able to deliver new seats in a timely fashion according to the terms of its contract," says American. "The seats are far behind schedule and continue to cause significant delays to our plans to improve the travel experience."

Zodiac did not respond to requests for comment.

Cleveland says seat manufacturers and producers of in-flight entertainment (IFE) systems may be straining to meet demand. Output at some "may need to



American is installing new business-class seats on its 777-200s

double" if they are to fulfil orders.

Carriers are increasingly filling those aircraft with advanced lie-flat seats in the front of the cabin and new "slim line" seats in the back. And, to provide consistent levels of service across their fleets, airlines are simultaneously upgrading in-service types with the same seats.

Major upgrades of IFE systems are also ongoing. Rick Wysong, PwC's director of transportation and logistics consulting, says passengers increasingly expect entertainment systems to evolve at the same rate as Apple's iPhone.

"Now, if you can't stream your

Netflix, you are getting a degraded product," he says. As a consequence, the lifecycle of IFE systems has declined from about 10 years to just three or four years, Wysong says.

"Now, even on domestic, short-haul flights, leading carriers are having to move to that shorter cycle," he says.

Executives at American have been warning about issues with Zodiac for months.

"We can all complain about seat manufacturers, but we can't fly the aircraft without the proper seats. It is really disappointing," said chief executive Doug Parker in March. ■

ORDER
STEPHEN TRIMBLE
WASHINGTON DC

Boeing converts freighter interest, but no launch yet

Boeing has received the first tentative order for a converted freighter version of the 737-800 from a Chinese start-up airline, but the programme has yet to be officially launched.

The Seattle airframer confirms that Hangzhou YTO Express Airlines has signed a commitment to order an undisclosed number – reported in local media as 15 – of the Boeing 737-800BCF.

Hangzhou YTO launched services on 26 September with a 737-300 freighter, the first of three examples the airline expects to receive. Meanwhile, Boeing is still building a business case for launching the freighter conversion of the 737-800, it says.

Both Boeing and Pemco have been polling customers for interest in the type as the 737NG is replaced by the re-engined 737 Max.

Boeing reportedly received an authority to offer the 737-800BCF last year, but had not previously announced any commitments.

The company remains in discussions with multiple airlines about the type, it says. "We look forward to launching the 737BCF programme once we have met our launch criteria," Boeing adds. ■



FINANCE STEPHEN TRIMBLE NEW YORK

Boeing unruffled by Ex-Im impasse

Airframer confident that US Congress will re-authorise the export credit agency, and that private finance can fill void

Boeing chairman Jim McNerney said on 24 September he is confident that the US Congress will re-authorise the US Export-Import Bank, but also conceded that private lenders would at least partly replace the bank if it ceased operations.

McNerney's remarks, at a Wing's Club luncheon in New York City, came nearly three months after the bank's charter expired on 30 June. The bank's funding for new loans ran out on 30

September, closing a major financing source for some Boeing customers.

Some analyses show Boeing's satellites and commercial aircraft account for nearly one-third of the Ex-Im bank's transactions.

A majority of lawmakers in both houses of Congress support the bank, McNerney says, but the leadership of the House has refused to bring reauthorisation to a vote. The bank is bitterly opposed by key conservative lawmakers,



Export finance enabled Air India to re-fleet with Boeing 787s

including Representative Jeb Hensarling, who chairs the committee overseeing the institution.

The uncertainty over the bank's fate illustrates the "dysfunction" of the US political system, McNerney says, but he is optimistic. "I am confident it will eventually be re-authorised," he says.

Critics say the bank is an unnecessary intrusion by government in private lending markets, offering loan guarantees or financing to foreign customers at below-market interest rates. Such deals have provoked major US carrier Delta Air Lines to complain Ex-Im bank loans have given overseas airlines – it singled out Air India – access to finance, enabling them to better compete against US operators. But McNerney argues Ex-Im bank loans are often used as a mandatory placeholder until a private lending source can be finalised. "It's often not needed in the end because private financing

steps in," McNerney says. "It will maybe be 10% of our competitions that it would put us at a significant disadvantage, because we would not meet the terms of the [airline's request for proposal]."

He did acknowledge private lending sources would fill some of the gap if the Export-Import Bank ceases to exist. "Does that mean private financing wouldn't probably step in? It probably would to some degree, but we'd still be disadvantaged," he says.

McNerney repeated Boeing's position that it would move manufacturing work out of the USA, if the bank loses its authorisation.

"I think it's inevitable," McNerney says. "As someone who has always made decisions to build domestically you'd have to evaluate – being able to access some financial support that is not available in your country. I don't have a plan for this because I think it's going to be reauthorised." ■

CREDIT LAURA MUELLER LONDON

GE power deal could have wider benefit

General Electric's 24 September agreement with UK Export Finance to access credit support of up to \$12 billion could help aviation customers. Although the projects being considered under the memorandum of understanding are drawn largely from the energy sector, UKEF says "the framework could cover any of GE's lines of business, including aviation, if there is sufficient UK content".

Since the US Export-Import Bank's authorisation expired on 30 June, GE has entered talks with export credit agencies – and concluded a pact with

French agency Coface – to secure financing for its customers.

"In today's competitive environment, countries with a functional export credit agency will attract investment," says GE chief executive Jeff Immelt. "Export finance is a critical tool we use to support customers. Without it, we can't compete against foreign competitors who enjoy ECA financing from governments."

GE Aviation recently linked investment in its Czech turboprop manufacturing facility to the expiration of the Ex-Im bank authorisation. ■

MANUFACTURING

First MC-21 stabiliser set for testing

Russian manufacturer Aviastar is preparing to send its first Irkut MC-21 horizontal stabiliser to Moscow for initial static tests.

The composite inner structure has been produced at the company's Ulyanovsk plant. It will be sent to the Central Aerohydrodynamics Institute [TsAGI] for tests before returning to Ulyanovsk for leading-edge fitting.

Aviastar components and assemblies head Mikhail Chuvashlov says the stabiliser will then undergo bird-strike testing.

The plant is also in the final stages of assembling the auxiliary power unit compartment for the first MC-21 prototype. Once systems are installed it will be transferred to the Irkut assembly facility.

Last month TsAGI successfully concluded stress tests of the MC-21's metal-composite fin torsion box. "Structural failure occurred in accordance with our calculations," says the institute.



Aviastar



Analysts bank on elliptical fuselage for 7M7 proposal
NEWS FOCUS P14

ANALYSIS ROB MORRIS LONDON

Bumpy road ahead for aviation cycle

Although not yet at tipping point, analysis of economic and aircraft values data reveals that danger signs are increasing

History warns us that when the ratio of aircraft deliveries to the installed fleet rises above 8%, the aviation industry risks tipping into overcapacity. Are we close to that point? This year, the figure will be around 7.2% and we expect this to pass 8% in 2016. Based on past experience, such levels could indicate that the number of aircraft in service is outstripping demand, and the buoyant Asia-Pacific market could be where the first danger signs emerge.

So, where in the cycle are we exactly, seven years after the global banking crisis last jolted confidence and put the brakes on airliner orders? At Flightglobal Ascend, we have analysed where we think our enduringly cyclical industry is today, with a look at four separate but related cycles – the global economy, which drives aviation demand, which in turn spurs aviation supply, the latter two of which determine aircraft values.

Let us start with global economic activity. Forecasts of GDP growth – we use Economist Intelligence Unit data – have slipped since last year, partly as a result of struggling economies in Latin America, particularly Brazil. While China is harder to read, there is growth momentum in the Eurozone area, the USA and UK. If we were to grade our outlook green, amber or red, we would place GDP currently at amber and trending into the red. Seven years



Demand for new aircraft in Asia-Pacific remains on the increase

into the cycle, there are more negative signs than we might expect at this stage.

That said, demand for air travel and airliners remains strong. Global passenger traffic is robust, with IATA figures for the first half of 2015 showing traffic growth of 6.3% over 2014, with – encouragingly – capacity growing more slowly (at 5.9%).

STILL GROWING

Even in Asia-Pacific, where we noted a risk of capacity outstripping demand – traffic growth remains ahead of the numbers of aircraft and flights being added. The demand cycle has not peaked yet.

When it comes to new orders placed, 2015 levels, though high,

are below the volumes seen in recent years. However, we should be careful not to see this as a weakening of demand. With the backlog at a record high level of over 14,000 and few slots available, sales are simply at a pause while the manufacturers work to deliver aircraft on order. We are not seeing major cancellations or deferrals either – cancellations have tended to be the result of minor adjustments rather than customer failures.

The aviation supply cycle too appears broadly positive. Over the long term, around four in 10 new aircraft will be used for fleet replacement. However, for the past five years, the proportion has been around half. This year to date, the metric is below 20%, close to the historical lows seen

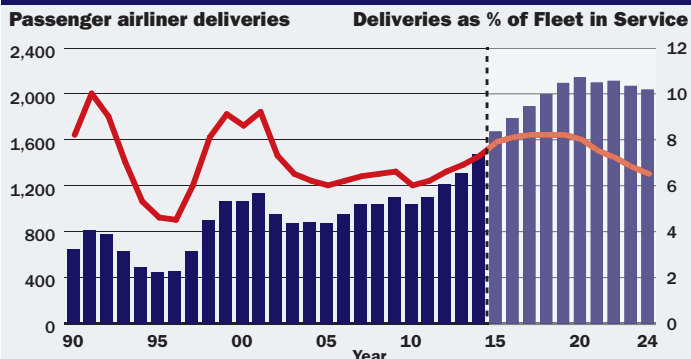
mid- or late-cycle. However, our forecast 8% level of deliveries to the installed fleet causes us to rank this as amber on our scorecard. In terms of aircraft utilisation, hours flown are at a near-historical high. But the trend is flattening. This is one of the first indicators to watch, as airlines constrain capacity as a precursor to caution when it comes to spending on new equipment.

VALUES PEAKING

Finally, turning to the values cycle, Ascend's latest Base Value update in July assesses that half of the global fleet has a Base Value below Market Value. Given the technology replacement phase we are moving into, we may be close to the peak of the Market Value cycle. We certainly do not expect to move any further towards the July 2008 peak which – in hindsight – looks like an overheated market. Ascend does not have concerns that we are heading to such a position this time.

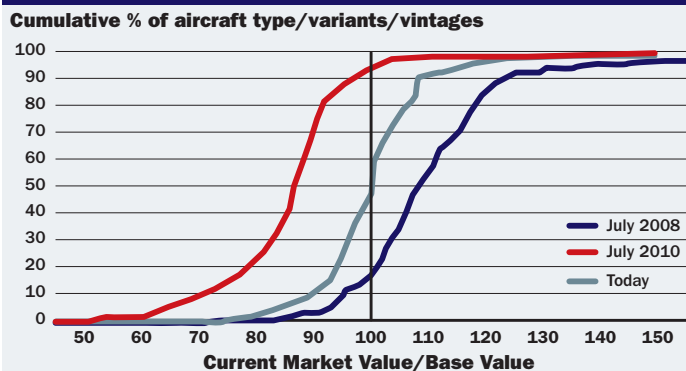
In summary, the aviation demand cycle continues to appear strong. Fuel prices are helping, but we will watch for signs of weakening demand in each region, and have concerns about the OEMs' increasing production rates. Things can turn very quickly and, if they do, the market will have to adjust capacity and deal with a surplus of supply over demand – and that can only have a negative impact on asset values. ■

ANNUAL DELIVERIES/FLEET PERCENTAGE



SOURCE: Flightglobal Fleets Analyzer & Flightglobal Fleet Forecast

CURRENT MARKET VALUE/BASE VALUE



SOURCE: Ascend Values



PROPOSAL STEPHEN TRIMBLE WASHINGTON DC

Analysts bank on elliptical fuselage for 7M7 proposal

Studies suggest that Boeing will favour oval cross-section for future development to address “middle of the market”

With speculation continuing about Boeing's plans for its next aircraft development programme, two reports now predict that the airframer's subsequent clean-sheet design will feature the aviation novelty of an oval fuselage cross-section.

Most recently, Merrill Lynch analyst – and former Boeing applied research scientist – Ron Epstein published a report for investors in September, saying Boeing's “middle of the market” aircraft study is likely to yield an elliptical cabin for the so-called 7M7 type.

ONE TO OVOID?

Epstein's findings echo a similar conclusion reported last June by Bjorn Fehrm, an analyst for Seattle-based Leeham, who believes that Boeing's designers will select an ovoid fuselage.

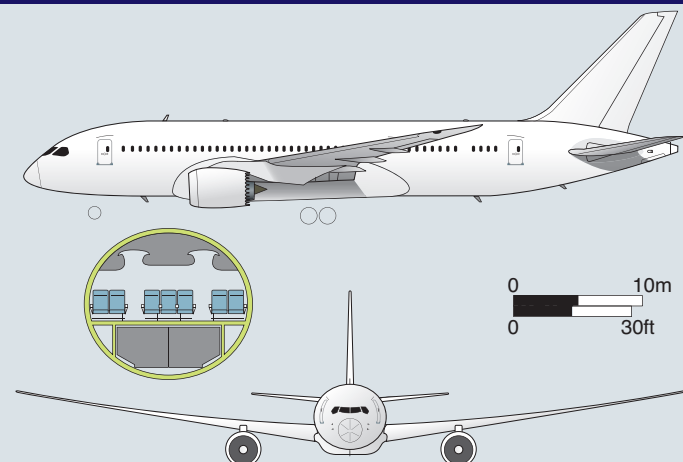
Neither report claims special knowledge of Boeing's internal deliberations and, so far, it has not revealed the potential con-

figurations that are under consideration. By pointing to the need for Boeing to break from traditional fuselage cross-sections, the analytical reports by Epstein and Fehrm reveal the challenge of optimising a new aircraft design with a historically unique combination of size and performance.

The 7M7, if launched, would fill what Boeing marketing vice-president Randy Tinseth has described as a “white space” in the market. Although some have called it a replacement for the 757 and the 767-200, the new aircraft would need to do more than either and at far lower operating costs.

As Epstein explains in his report, airlines today can choose between a narrowbody that seats up to 220 people, and with a maximum range of about 3,500nm (6,470km), or a widebody that accommodates between 250 and 500 passengers, with a maximum range no shorter than 6,000nm.

MERRILL LYNCH'S PROPOSED BOEING 7M7 CONCEPT



SOURCE: Merrill Lynch Global Research
Tim Bicheno-Brown/Flightglobal



The market Boeing is now targeting sits in between that combination of size and endurance.

The 7M7 would feature seating for about 220-270 people and be able to fly around 5,000nm.

If the requirements were only that simple, Boeing could rely on the circular or “double-bubble” – two circles cinched at the floor line, usually with an elongated lower lobe to maximise space for cargo – cross sections of most aircraft in service today.

But it will probably not be that simple, as the Epstein and Fehrm reports suggest.

Some of Boeing's most influential customers, such as Air Lease chief executive Steven Udvar-Hazy, have publicly demanded that the 7M7 deliver narrowbody-like economics on a per-seat basis.

That creates quite a challenge. Widebody aircraft provide

Concerns about pressurisation have forced large aircraft manufacturers to use circular cross sections

slightly more cabin volume on a per-seat basis than a narrowbody, so the per-seat operating economics are higher.

The 7M7 is expected to fly much farther than either the 737-900ER or Airbus A321, yet deliver at least equivalent operating economics. And that's why analysts such as Fehrm and Epstein expect Boeing to literally break the fuselage mould with the 7M7, producing an aircraft much wider than it is tall.

Both analysts point to a string



US Army engine battle spools up
DEFENCE P16

A new programme would be a partial successor to the Boeing 757 twinjet



AirTeamImages

of Boeing patents published between 2003 and 2010, showing various designs and technologies necessary to produce an elliptical aircraft. Many of the patents were co-authored by Mithra Sankrithi, a 32-year Boeing veteran and now chief of product development for airplane integration and product evaluation.

NEAR-ELLIPTICAL

One such patent drawing, published in 2007, presents a design for “pressurisable aircraft fuselage structures having near-elliptical cross sections”, with seven-abreast seating in a twin-aisle cabin, with enough space below deck to fit a single row of standard LD-3 cargo containers.

That patent filing served as the basis for the concepts presented in both Epstein’s and Fehrm’s reports.

Fehrm traces Boeing’s interest

in elliptical cross sections over that period to the now-delayed pursuit of a true replacement for the 737.

Until mid-2011, the Boeing Commercial Airplanes division seemed focused on replacing the 737NG series with a clean-sheet design, and the elliptical fuselage configuration was their preferred shape, he says. Boeing had previously studied other options. The 7J7, for example, proposed to replace the 737 Classic series in the late 1980s with a clean-sheet aircraft with a 4.17m (13.6ft)-diameter fuselage. That would make it 0.21m wider than an A320, but 0.86m narrower than a seven-abreast 767.

As a result, the 7J7 was not wide enough to be a twin-aisle, but did offer a more comfortable cabin with wider seating and central aisle.

Another decade would pass

before Boeing would begin seriously considering elliptical cross sections, based on the flurry of patents filed in the last decade.

The raw appeal of an elliptical fuselage shape is clear: for the same amount of wetted area – the portion of the hull in contact with the external air flow – a purely circular fuselage usually cannot carry as many seats. A lower wetted area for the elliptical fuselage also means less drag.

Another consideration is the length of the fuselage.

A six-abreast cabin in a narrowbody fuselage for 250 passengers would result in an excessively long cabin, causing slow and inefficient boarding and deboarding periods, he says.

The optimal seating for a 7M7-sized aircraft is instead a seven-abreast cabin, he adds. But achieving narrowbody-like economics is only possible with an elliptical fuselage, not a circular shape with greater drag.

GEOMETRY

There are, however, drawbacks that must be considered.

The geometric advantages of the elliptical shape have always been known, but concerns about pressurisation have forced the manufacturers of large aircraft to use circular or double-bubble cross sections.

Any pressurised vessel seeks to reshape the containment into a circle anyway, so any non-circular shape must be strengthened to resist these forces. Adding layers of reinforcement increases the weight of the fuselage, leading designers to favour circular cross-sections.

But Fehrm points to a key innovation of the last decade that may overcome the concerns about pressurisation.

Aircraft fuselages can now be made from composite material, such as the carbonfibre reinforced plastic (CFRP) that comprises the fuselage and wing skins of the 787.

Adapting such materials to an aircraft with 5,000nm range should not be a technological stretch for the 7M7, which would enter service more than a decade after the Dreamliner.

Other criticisms of an elliptical cross section are more difficult to dismiss.

Hans Weber, president of the San Diego-based consultancy TECOP, says he would be shocked if Boeing decides to use an elliptical cross section for an aircraft with a 5,000nm range.

“Innovation comes about because somebody breaks through the conventional picture”

HANS WEBER

President, TECOP

Airlines expect an aircraft with that kind of performance to carry a significant load of commercial cargo, in addition to the passengers’ luggage, he says.

Because an elliptical shape is wider at the middle than it is tall, there is less room below the passenger cabin available for cargo. The patent drawing cited in the Epstein and Fehrm reports shows room for a single row of LD-3 containers.

CARGO CULT

“I still don’t get it, because I’m still hung up on the loss of cargo area,” Weber says.

“I’m surprised. Somehow there’s an inherent contradiction in a relatively long-haul airplane with an elliptical fuselage.”

Weber is aware of the benefits of such a shape as it applies to a short-haul, narrowbody aircraft.

Airlines do not expect short-haul aircraft to carry the same ratio of cargo as an aircraft that has a range of up to 5,000nm, he says. But Weber is not ruling out the idea of a long-haul aircraft with an elliptical fuselage.

Instead, he says he sees that lack of cargo space as yet another challenge that Boeing will have to overcome, if conventional fuselage cross sections are not quite sufficient.

“Innovation comes about because somebody breaks through the conventional picture,” he says. “It would be fascinating to see if Boeing does it, if it turns out that there are benefits.” ■



ROTORCRAFT STEPHEN TRIMBLE WASHINGTON DC

US Army engine battle spools up

Service anticipates further bidders joining the current two contenders hoping to lift its transformational ITEP award

The US Army has launched its long-awaited search for an improved engine design for nearly 3,000 medium-twin helicopters, with the potential of a surprise additional bidder.

For nearly a decade, the competition has shaped up as a battle between incumbent T700 supplier GE Aviation, which is offering the single-spool GE3000, and the Honeywell/Pratt & Whitney

AATE joint venture's dual-spool HPW3000. The rivals have each developed and tested prototype engines and new inlet particle separators under the army-funded advanced affordable turbine engine (AATE) technology maturation programme.

But at least one more bidder could join the next phase of the competition, in which the army will award contracts before the



US Army

A new design should replace the Black Hawk's twin T700s

end of fiscal year 2016 to up to two firms to produce a preliminary design of the improved turbine engine, or ITEP.

"We fully expect other engine vendors that didn't participate in AATE to come to participate in this programme as well," says Lt Col Curt Kuetemeyer, the army's ITEP product manager. "We feel confident that they can mature the specific technologies we have for production."

The army's goal for the ITEP is to increase power output over the T700 by nearly half, while reducing specific fuel consumption by one quarter. The entire package must fit inside the current design's dimensions, as installed on more than 2,100 Sikorsky UH-60

Black Hawks and nearly 700 Boeing AH-64 Apaches.

Of the two other leading engine manufacturers which could participate in ITEP, Rolls-Royce says it has no plans to join the competition. Turbomeca – which supplied the RTM322 for the UK's Apache fleet – did not respond to a request for comment.

Successful bidders will be given 24 months to produce preliminary designs for the ITEP engine, before the army downselects to a single bidder for a six-year engineering and development phase. The programme could potentially also power light and medium rotorcraft for the service's high-speed future vertical lift requirement. ■

PROPOSAL STEPHEN TRIMBLE WASHINGTON DC

Honeywell eyes Lakota power upgrade

Honeywell plans to offer Airbus Group Inc its HTS900 for a potential requirement to re-engine the US Army's UH-72A Lakota fleet. A recently issued request for information from the US arm of Airbus Group invited the proposal, says Tom Hart, Honeywell's vice-president of defence and space.

"Airbus is looking for what future engines could be used for that mission, if required," Hart says. The 1,000shp (746kW)-class HTS900

would provide a boost for the twin-engined Lakota, currently powered by 738shp Turbomeca Arriel 1E2s.

The company – which manages the Airbus Helicopters EC145-derived fleet – is considering re-engineing options in case the army decides to add new missions, or requires more power, says Hart.

"The HTS900 actually has similar mounting points to that aircraft already, so it would be a nice application," he adds. ■

EXERCISE JAMES DREW WASHINGTON DC

Atlas proves strength during Stryker assessment

The UK Royal Air Force deployed one of its four operational Airbus A400Ms to the USA in late September, to participate in a network integration evaluation exercise at Fort Bliss in Texas. The activity included conducting loading checks with the US Army's Stryker armoured fighting vehicle and other heavy military equipment.

Talking to *Flight International* during a stop-off in Washington DC, Wg Cdr Simon Boyle, officer commanding the RAF's 70 Sqn, said the service is now capable of deploying the Atlas to prepared airstrips in "benign" operating



James Drew/Flightglobal

The RAF's A400M was deployed via a stop in Washington DC

environments. "We're very much in the development phase with the RAF and the programme in general, in terms of how we're

working with Airbus Defence & Space to unlock what are going to be the very considerable capabilities of the aircraft," he says. "In-

crementally, over the coming months and years, we'll move from the strategic air transport aircraft it is now into the tactical airlifter that it's supposed to be."

The process will start with defensive aids subsystem-equipped A400Ms in mid-2016, Boyle says. "In the early part of 2017 we should be able to deploy a limited number of aircraft and sustain them away from home base. Towards the end of 2017 we'll be starting initial tactical roles, which we would define as low-level flight and delivery of personnel and stores, and landing on rough and unprepared strips." ■



Canada extends
fixed-wing search
DEFENCE P19

COLLABORATION BETH STEVENSON LONDON

Sagem Patroller on offer to Egyptian armed forces

Sagem has teamed up with AOI-Aircraft Factory to offer its Patroller unmanned air vehicle to the Egyptian armed forces.

The “exclusive commercial and industrial collaboration” will enable the French company and its partner to offer the medium-altitude, long-endurance UAV to the Egyptian defence ministry, should a requirement emerge.

Cairo-based AOI-Aircraft Factory would be responsible for the

in-country final assembly of the Patroller, and would also provide system support and commissioning, according to Sagem. The company also plans to establish a training centre to prepare personnel to operate and maintain the air vehicle.

Sagem has yet to secure an order for its Patroller, although the system and Thales’ Watchkeeper are being offered to meet the French army’s tactical



AOI-Aircraft Factory would be responsible for final assembly

UAV requirements. Paris is expected to announce a decision in the coming weeks.

The Patroller is the result of a teaming agreement between Sagem and Germany’s Ecarys/Stemme, which produces the airframe. Selex ES provides its syn-

thetic aperture radar and avionics equipment, while it is also offered with Sagem’s Euroflir 410 electro-optical/infrared sensor.

Egypt in July took delivery of its first of 24 Dassault Rafales, under a deal signed with France early this year. ■

TESTING JAMES DREW WASHINGTON DC

KC-46A debut fuels USAF’s ambitions

Nine-month delay to fully-configured tanker flight leaves Boeing playing catch-up to enable production decision in April 2016

Boeing’s first fully-configured KC-46A tanker made its debut flight on 25 September, lifting off from Paine Field in Washington and touching down at Boeing Field 4h later.

“During the flight, Boeing test pilots performed checks on engines, flight controls and environmental systems, and took the tanker to a maximum altitude of 35,000ft,” the company says.

The event took place roughly nine months behind schedule, and almost five years after the Pegasus entered development. Its debut had previously been due in late 2014, but issues including misplaced wiring and a contaminated fuel system delayed the multi-billion dollar development programme, which is now working towards achieving a “Milestone C” production decision, now expected in April 2016.

A Boeing 767-2C prototype recently completed airworthiness and flutter tests carrying a weight-representative boom and wing aerial refuelling pods (WARP). Unlike this first engineering and manufacturing development aircraft, the KC-46A (EMD-2) is configured to pass fuel to receiver aircraft. Its performance over the next five or six



EMD-2 made system checks during a 4h transfer from Paine Field

months will determine the Pentagon’s decision, which should lead to the award of first and second low-rate initial production contracts; for seven and 12 aircraft, respectively.

The KC-46A should lower its refuelling boom and unreel its WARPs within the next couple of test flights, before EMD-2 will be returned to the fuel dock to test out its full refuelling system, also including a centreline hose-and-drogue system. This will be followed by free air stability testing.

“We’ll fly the envelope we expect to fly in the Milestone C demonstration points, and make

sure all the stuff is occurring properly,” USAF tanker programme executive Brig Gen Duke Richardson said in advance of the flight.

“This is where we can give the receiver aircraft confidence they want to receive fuel from the KC-46 [before] heading into the aerial refuelling demo.” The Pegasus must pass fuel to six types of aircraft during this phase, including another KC-46.

Richardson praises Boeing for swiftly preparing EMD-2 after a fuel contamination incident. “I thought it was going to take a lot longer than 30 days to get that air-

plane back out on the fuel dock,” he says.

“[Boeing development chief Scott Fancher] was able to bring in resources from Boeing Commercial – additional mechanics – and they got that airplane rebuilt very, very quickly.”

The KC-46A will eventually recapitalise the USAF’s Boeing KC-135 and McDonnell Douglas KC-10 fleets, with the service intending to order 179 up to 2028.

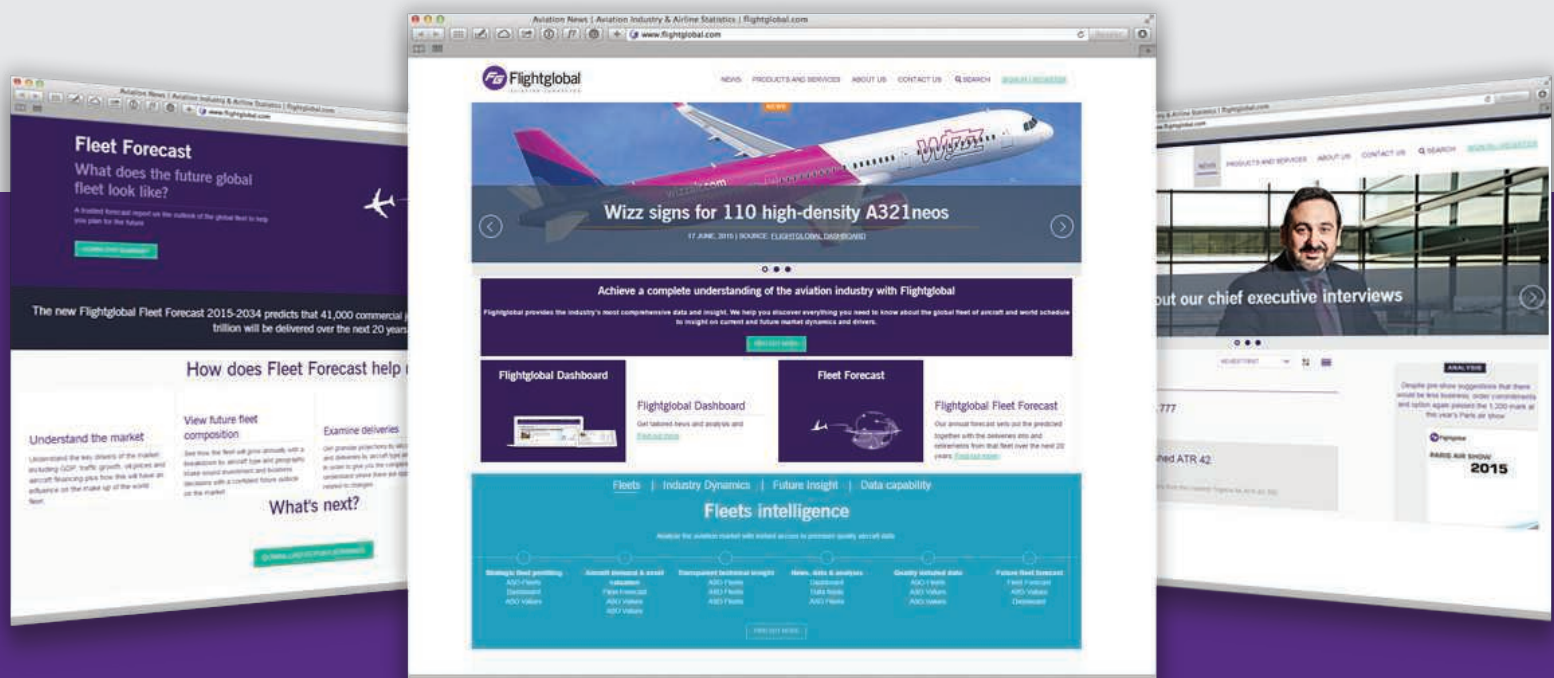
In mid-September, work began at Pease Air National Guard Base in New Hampshire to update two 1950s-era hangars to accommodate the new type, 12 of which will arrive in February 2018.

This will follow the delivery of aircraft to a training unit at Altus AFB, Oklahoma and to McConnell AFB in Kansas, which should receive the first of a planned 36 tankers from next year. Boeing says it will meet its contractual obligation to deliver the first 18 operational aircraft by August 2017.

With the programme delayed and the manufacturer having incurred additional costs of \$1 billion, Richardson notes: “I’m not going to give up on them, but as time goes on, we’ll see if there’s realism in that confidence.” ■

Times are changing... So is Flightglobal.com

We have given our website a complete make-over bringing you an even better experience. Use our simpler navigation to find the news and insights you need. Plus, explore in depth how our products and services can help you.



Check it out at
www.flightglobal.com



Growing UAV use
leads services to
study capabilities
NEWS FOCUS P20

PROCUREMENT DOMINIC PERRY LONDON

Canada extends fixed-wing search

Airbus and Alenia have time to hone their offers, but delay could open door to potential rivals Embraer and Lockheed

Both confirmed bidders for Canada's long-running fixed-wing search and rescue (FWSAR) requirement are using the latest process delay to hone their offers.

Ottawa has been trying to replace the Royal Canadian Air Force's six aged de Havilland Canada CC-115 Buffalos and 13 Lockheed Martin CC-130 Hercules since 2004, with a latest request for proposals (RFP) issued in March 2015.

EXTENDED

Submissions were due by 28 September but, faced with a complex set of capability requirements in a document numbering over 4,000 pages, the bidders were in some areas forced to make assumptions. As a result, the Public Works and Government Services Canada procurement body has extended the deadline until 11 January 2016.

So far, only Airbus Defence & Space and Alenia Aermacchi – with their Canadian partners – have confirmed participation in the contest, respectively offering the C295 and C-27J Spartan. However, Embraer and Lockheed could also respond.

"I think this is a good thing, because it will allow us to make sure the aircraft and mission system and so on are able to move forward," says Steve Lucas, a strategic advisor to the Alenia-led Team Spartan and a former Canadian Forces chief of air staff. "We consider ourselves in a much better position now to provide Canada with what it wants."

Lucas says the RFP stipulates bidders must submit three- and four-base solutions, with an option to offer a fifth, if needed, to meet Ottawa's requirements. "Alenia doesn't have that issue.



Royal Canadian Air Force

Ottawa wants to replace de Havilland Canada CC-115 Buffalos

Our submission is only three- and four-base bids," says Lucas, who declines to be drawn on the number of aircraft the company has proposed. An earlier RFP called for 15 units, and he says Alenia's bid is "plus or minus" that.

Airbus says it will satisfy the requirements "using Canada's basing structure". The air force's fixed-wing SAR fleet operates from four locations, with a fifth site providing rotary-wing cover.

Describing the C295 as a "proven, reliable and low-risk solu-

tion", Airbus says the deadline extension "means Canada will be able to make the clearest choice and get the aircraft it needs."

An initial downselect next year will be followed by flight and ground evaluations for the remaining bidders. Airbus is partnered with Pratt & Whitney Canada, L-3 Wescam, CAE, Vector Aerospace and Provincial Aerospace. Team Spartan includes General Dynamics Canada, IMP Aerospace, KF Aerospace and CMC Esterline. ■



TRANSFER

USAF ready to release its Liberty fleet

As the last MC-12W Liberty was removed from the US Air Force's inventory on 1 October, the service's Air Combat Command (ACC) says all of the reconnaissance aircraft will be going to new owners.

Of 41 adapted Beechcraft King Air 350s available, 26 are destined for use by the US Special Operations Command, while 11 are being transferred to the US Army. The plan for the remaining four is still being finalised, says the ACC, which performed a ceremonial final flight with the type at Beale AFB in California on 16 September.

Since its first combat mission on 10 June, 2009, the MC-12 community accumulated 400,000 combat hours and participated in 79,000 combat sorties in Iraq and Afghanistan, the USAF says.

**Download the 2015
World Air Forces Report**
www.flightglobal.com/waf

IN ASSOCIATION WITH
**Together
ahead. RUAG**



STRATEGY BETH STEVENSON RNAS CULDROSE

Growing UAV use leads services to study capabilities

Beyond the Royal Air Force, the UK's military is largely inexperienced in unmanned operations, but keen to learn

In an effort to progress understanding of unmanned air system operations, the Royal Navy held a maritime UAS awareness conference at RNAS Culdrose – home of 700 Xperimental (700X) naval air squadron that operates the Insitu ScanEagle unmanned air vehicle – on 24 and 25 September.

While the Royal Air Force is considered a fairly experienced operator of UAVs, its sister services are not. The Culdrose conference was designed to serve as a forum to discuss the pros and cons of introducing UAVs into routine operations that were, until recently, dominated by manned aircraft.

"We are seeing the most incredible leap in unmanned technology that is really starting to transform the way we operate at sea, overland, and even in the civilian enterprise," Rear Adm Keith Blount, assistant chief of the naval staff for aviation, amphibious capability and carriers, told the conference.

"This creates for us the most

intoxicating mix of opportunity, but brings with it challenges as well," Blount says. "In an airspace becoming more and more cluttered with various pieces, not least with unmanned technology, we have to understand how, in that airspace, we can operate safely."

Blount says the use of unmanned technology is "absolutely embedded in the conscience of the main navies now", as well as air forces and armies.

"The most incredible leap in unmanned technology is starting to transform the way we operate"

REAR ADM KEITH BLOUNT
ACNS for aviation, amphibious capability and carriers

One notable example is the RN's introduction of ScanEagle, procured under a contractor-owned, contractor-operated two-year urgent operational requirement in



2013. This has since been extended until 2017. "From a naval perspective, I watched in awe as we started to operate ScanEagle off ships," Blount says. "I am amazed by the potential that one small UAV can bring to maritime operations. Yes, it's a small area in which it is operating, but even within its own limitations, the capabilities it brought were incredible."

When ScanEagle deployed to theatre for the first time on board the Type 23 frigate HMS *Somerset* in support of the UK's Operation Kipion – a stabilisation effort in the Gulf and Indian Ocean – the feedback was generally positive, Lt Cdr Rudi Lorenz, UAS capability manager at navy command headquarters, and *Somerset's* UAS commander, says.

"We sailed into theatre and operated for months under the UKMCC [UK Maritime Component Command], and we provided some good output and learnt an awful lot while we were out there," he says.

"Persistent and intimate ISR [intelligence, surveillance and reconnaissance] is why we had ScanEagle, and it delivered that very well indeed," he says. "Once we've done overwatch with persistent ISR, we start to look at surface search. ScanEagle has an electro-optical/infrared

[EO/IR] camera, but that doesn't really give a great find function."

Despite this search capability not being the primary function of ScanEagle, it did not stop the navy trying to get around it: "We found that if we got the camera looking up and onto the horizon, we were able to achieve a very limited search function. If we did enable a find function within our air system itself, we may well see a game changer with regards to manned aviation hours."

Although the number of personnel required for the UAV detachment did not represent a reduction, says Lorenz, the contribution of the combined assets was an overall improvement.

SORTIES

"On *Somerset* itself, we did not reduce the manned hours; what we did manage to do is curtail some of the flying the [AgustaWestland] Lynx [helicopter] was doing on surface search sorties by using ScanEagle, then bring the Lynx back and preserve it for more important things later on."

"The Lynx was able to fly the hours it does ordinarily, but it was able to specify better tasking," he says. "In terms of ScanEagle, while there isn't a physical reduction in manpower on board, you're seeing 24h airborne operations for the same amount



Black Hornet nano UAVs are part of the marines' core equipment



\$10m lift for TriFan design
BUSINESS AVIATION
P22



Crown Copyright

British Army units are gaining more experience with the Watchkeeper

of manpower you'd have for a manned asset conducting maybe a 10-12h alert period."

If a UAV were to be introduced with the search capability that is missing from the current ScanEagle configuration, Lorenz is confident that a manned asset like the Lynx could be employed more intelligently.

Elsewhere, the British Army operates the Lockheed Martin Desert Hawk UAV and is in the process of introducing the Thales WK450 Watchkeeper, both of which will eventually be incorporated into the same brigade.

"We're not really into the strategic UAS space at the moment; we are in the area of the tactical UAS," Maj Tom Luker of 47 Regiment, Royal Artillery – part of the army's 1st ISR Brigade – explains.

Luker praises the Watchkeeper UAV's 16h endurance and its Thales I-Master radar: "The key thing about the aircraft is that it doesn't just have the EO/IR, but the I-Master radar, that can be operated in a synthetic aperture radar [SAR] mode or a ground moving target indicator [GMTI] mode," he says.

"So you can cross-cue yourself... when you are trying to look with EO/IR, your ranges are relatively limited, to 7-8km. But with a synthetic aperture radar, you can build up a big picture at about 30 miles."

However, while Luker admits that the system is fairly easy to deploy, he notes that there is quite a lot of associated ground equipment, so "it's a deliberate operation; you won't just be doing that off the cuff".

"We are not yet at full operational capability [FOC], but we are building towards that in 2017. So we are only flying out of Boscombe Down and are quite limited to only fly over Salisbury Plain," he adds. Such complexity contrasts with the operation of the Desert Hawk, which is a relatively straightforward UAV to fly.

"This is a complex system, which is not easy to operate. So we're building capacity – but this is taking some time. We're also often affected by poor UK [weather], especially wind."

OPERATIONAL TESTING

The teaming associated with the operation includes pilots, launch and recovery crew, maintainers, image analysts, operations room staff, and air traffic controllers.

Watchkeeper underwent an eight-week deployment to Afghanistan in 2014 as the UK wound down its operations, in order to test the UAV in a live environment.

"In one way this was a great thing, because it proved it was operationally viable and valid," Luker says.

"The downside is that it is fixed in people's minds that it has been in operations, so you must be at FOC. Sadly, both factors are true and not true simultaneously." He notes that the SAR/GMTI capability was proven in Afghanistan, and the EO/IR sensor was clearer than on its predecessor, the Elbit Systems Hermes 450. While the sensor itself is the

"We've been able to fly this [Black Hornet] in the jungle environment, which has been useful"

SOURCE

SRS Sqn, 30 Commando IX, Royal Marines

same, the computing behind it has been modified, so the image is sharper.

"We are under a reasonable amount of pressure to fly and build capability," Luker adds. "There's a certain amount of scrutiny that isn't always helpful. We're looking to go to overseas locations to build up a good portfolio of hours flown and to build up our experience in the air."

Access to airspace is never simple, and while Watchkeeper flies in safe segregated airspace from Boscombe Down, the platform only comes third in terms of priorities at the airfield.

"But we are on track for full operational capability in 2017, and this is fully funded out to 2042, so it is ongoing," says Luker.

The Royal Marines is not a conventional operator of UAVs, but utilises data feeds from a variety of airborne sources as it serves as the bridge between maritime and land operations.

"We're tasked with collecting information superiority to win the battle," says an officer from 30 Commando Information Exploitation (IX) Group's Surveillance Reconnaissance Sqn (SRS). "The task for SRS is not just to go out there and find stuff – we are targeted now in how we do our business."

He says the same six-man

teams have to be able to conduct the same missions in environments ranging from mountains to the jungle, desert and urban operations. Of these, the desert is the only one suited to UAV use. "I don't have a bottomless budget to go out and find the perfect answer for all of those set-ups," he adds. "Urban is really a growth area for us, because our adversaries are looking to operate in that environment more."

IN THE JUNGLE

The marines operate the Prox Dynamics Black Hornet nano UAV, which in August was brought into the UK's core equipment set. "We've taken that [urgent operational requirement], brought it back into core, and in SRS fly that out [0.8nm] 1,500m at 300ft," the officer says. "We've also been able to fly this in the jungle environment, which has been really useful." The type is easily affected by weather, he says, but that is less of a concern.

"The time I would use this, is when I don't want to put the team on the ground; on a nice sunny day when we don't want to be seen, this [Black Hornet] is perfect." The officer adds that he is constantly looking to lighten the load for the marines, which needs to be balanced out with capability.

"My frustration is I have to lighten the load on the ground," he says. "The next issue is, do we need the platform or the feed?"

"The advantage of owning a platform is it is organic and we can use it whenever we wish, however what would be better to lighten the load, would be a tablet – you can have somebody else fly the platform that you own." ■

Insitu ScanEagles from 700X NAS were deployed on HMS Somerset in support of Operation Kipion



Ree Shutterstock



PROGRAMME STEPHEN TRIMBLE WASHINGTON DC

\$10m lift for TriFan design

Crowdfunding effort raises initial equity to begin development of unique business aircraft

A Denver-based start-up has raised \$10 million in equity “crowdfunding” to help develop a ducted-fan-powered, fixed-wing business aircraft called the TriFan 600.

XTI began a crowdfunding campaign on the startengine.com website on 25 August, soliciting contributions to be converted into shares after the company holds an initial public offering.

It plans to register with the US Securities and Exchange Commission within a “few months”, says XTI vice-chairman Jeff Pino, a former president of Sikorsky. If the SEC approves the filing, the investors who contributed on startengine.com can turn “expressions of interest into

share purchases”, Pino says. XTI is also privately raising funding from venture capital, private equity and accredited investors.

More discussions are under way with vendors, which “will lead to building a prototype”, the company says.

XTI began developing the TriFan 600 in early 2013, seeking to design an aircraft with business jet-like speed and the take-off and landing performance of a helicopter. The company claims the TriFan 600 will become the first certificated vertical take-off aircraft, perhaps drawing a distinction between it and the AgustaWestland AW609 developmental civil tiltrotor.

The six-seat TriFan design in-

cludes two turboshaft engines powering three ducted fans – including two articulating systems embedded in the wing – and a fixed ducted fan encased in the aft fuselage.

The aft-based fan appears to provide vertical thrust, with assistance from the fans in the wings. Those fans also rotate 90° to provide forward thrust to the new aircraft.

Aside from Pino, XTI’s management team includes other aerospace industry leaders, such as former Cessna president Charles Johnson. Dennis Olcott, former vice-president of engineering for failed start-up Adam Aircraft, is a board member for XTI and chief of engineering. ■



Lift is provided by three ducted fans, giving the fixed-wing type vertical take-off capability

ROTORCRAFT
DOMINIC PERRY LONDON

Ultra-light model to join Russian Helicopters fleet

Russian Helicopters has revealed ambitions to develop a new “ultra-light” rotorcraft.

In an interview published on the manufacturer’s website, chief executive Alexander Mikheev notes the segment is the only one in which it does not compete.

“In the near future, Russian Helicopters is going to address this issue and introduce a helicopter in this class,” he says.

It does not provide details on what it classes as ultra-light, but the smallest types in its line-up are the 3.6t maximum take-off weight Kamov Ka-226T and Kazan Ansats twins.

Mikheev also emphasises Russian Helicopters is open to collaboration with Western manufacturers despite tensions caused by the conflict in eastern Ukraine.

“Russian Helicopters never refuses to implement joint projects with foreign companies, regardless of ownership. We’re always open for a dialogue,” he says.

“Our partners from the European Union, Canada and the US share the same attitude and hope, as we do, political decisions will not become a deterrent factor.”

PW207K engines from Pratt & Whitney Canada power the Ansats, while French-built Turbomeca powerplants are installed on both the Ka-226T and the developmental Ka-62. ■

CHARTER KATE SARSFIELD LONDON

Empire Aviation gains reach with San Marino base

Dubai business aviation services provider Empire Aviation (EAG) is expanding its international focus following the award, last month, of an air operator’s certificate (AOC) from the San Marino Civil Aviation Authority.

It is the first AOC to be granted to a Middle Eastern operator by the small European republic, situated on the Italian peninsula.

“We are looking to grow our operation outside the United Arab Emirates,” says EAG executive director Paras Dhamecha. “We evaluated several [jurisdictions] for our new AOC, but opted for San Marino as it permits worldwide commercial air operations, regardless of where the aircraft is based.”

This is in contrast to the UAE, where more than half of EAG’s

25-strong fleet of mainly high-end managed business jets is located. “UAE-registered aircraft cannot be based outside the country and this is too restrictive,” explains Dhamecha.

“Other registries that are popular with our owners are Bermuda, Cayman and the Isle of Man, but these are limited to privately operated aircraft.” More owners are looking to receive income from

their business jets by chartering their excess capacity, “so we need a registry with full flexibility”, he says.

EAG has established a subsidiary in San Marino to oversee the operation. One T7-prefixed aircraft – a Dassault Falcon 7X – has been added to the AOC, and others are expected to join the long-range tri-jet over the next 12 months, says Dhamecha. ■



Orbital ATK fired up to deliver goods
LAUNCHERS P25



Wheels Up

The company was launched on the back of a King Air 350i order

EXPANSION KATE SARSFIELD LONDON

Funding bankrolls Wheels Up growth

Membership-based operator nets \$115 million investment to fuel US expansion and its planned first foray into Europe

US membership-based operator Wheels Up has raised \$115 million from a handful of private investors to fund its next phase of expansion.

Kenny Dichter, founder and chief executive of the New York-headquartered company, says the latest round of financing will underwrite Wheels Up's US growth and fund a planned foray into Europe, which is set for late 2016.

The capital will also be used to improve Wheels Up's IT systems and pave the way for a bespoke "ride-sharing feature" for its 1,000-plus members. Wheels Up was launched in 2013 on the back of a record order for 105 Beech-

craft King Air 350i twin-engined turboprops, of which 39 are now in service. It also operates 10 pre-owned, customised Cessna Citation Excel/XLS business jets.

The Wheels Up fleet is operated by Gama Charters, the US subsidiary of UK-headquartered business aviation services provider Gama Aviation. This operating partnership is likely to be extended to Europe, where Gama is already a long-established King Air maintenance provider and operator.

The Farnborough-headquartered company has, since 1993, been flying and supporting two King Air 200Cs on behalf of the Scottish air ambulance service. ■

INTERIORS KATE SARSFIELD LONDON

Bright future for 787 shade maker

VIP aircraft interior parts manufacturer Jeff Bonner Research and Development (JBRND) has delivered its first electronically controlled window shades for the Boeing Business Jet 787. The handover comes less than a week after the lightweight system, called SyncDrive, secured US certification.

While JBRND designs and develops shades for business aircraft including the BBJ and Airbus Corporate Jet families, this is the first system designed for the

VIP-configured 787, says the San Antonio, Texas-based manufacturer. "SyncDrive window shade units are designed to be installed behind a standard or custom sidewall panel and can be integrated into various aircraft cabin management systems," says JBRND. "They operate with or without the electronic dimming windows that are standard on 787 aircraft." SyncDrive shades have been selected for four of the 12 BBJ 787s on order or in various stages of completion. ■

MAINTENANCE KATE SARSFIELD LONDON

Domestic MRO provider to propel China business

Hartzell Propeller has appointed maintenance, repair and overhaul provider Shenyang Avias Aviation Maintenance Engineering as its first service and support centre in mainland China.

To prepare for an impending surge in business from Chinese operators of Hartzell propeller-driven aircraft, the US company says Shenyang Avia's engineers have had weeks of "intensive" training at its production facility in Ohio. According to Hartzell, there are more than 300 aircraft in China with its propellers. These include the piston-engined Air Tractor AT-802, Diamond DA40, Mooney M20 and Cirrus SR series, as well as the Quest Kodiak, Piaggio P180

Avanti, Pilatus PC-12 and Viking Air Twin Otter Series 400 turboprops.

Piqua-based Hartzell says it is working with China's civil aviation administration to establish additional repair facilities for the country's growing inventory.

Hartzell has 24 service facilities across the globe including in Australia, Brazil, Malaysia, the United Arab Emirates and the UK, and is looking to grow the network further. "It's our long-term goal to ensure customers throughout the world are only a short drive or flight from a Hartzell-recognised facility," it says.

Shenyang Avias is located near Shenyang, the provincial capital and largest city of Liaoning province in northeast China. ■



aerodays2015
Aviation in Europe – Innovating for Growth
The 7th European Aeronautics Days

**OVER 200 KEY SPEAKERS
UNIQUE 3 DAY EVENT
OVER 1000 INDUSTRY
STAKEHOLDERS**
(...and only once every 4 years)

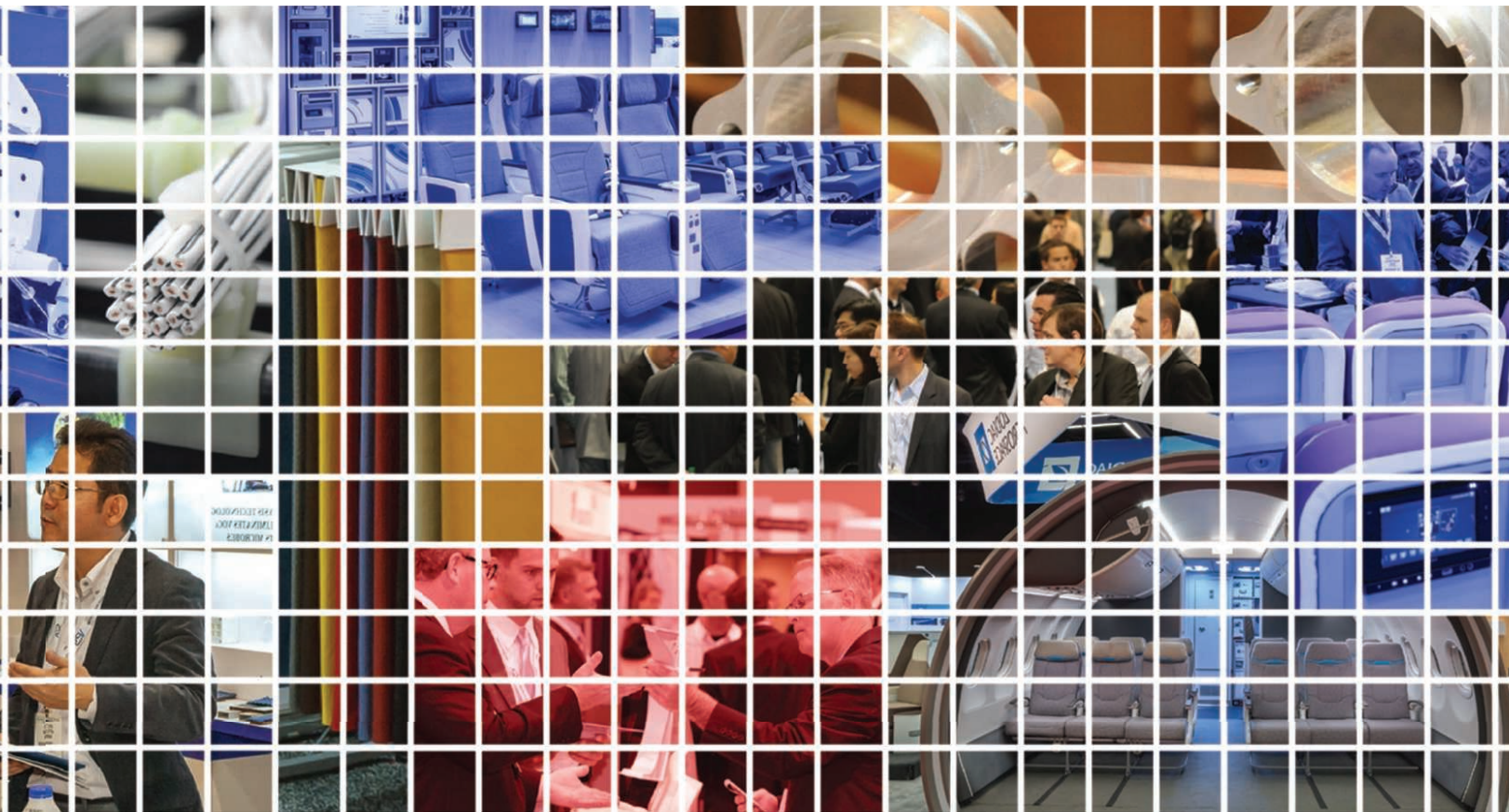


REGISTER NOW!
go to www.aerodays2015.com
to book your place

A must attend event for anyone with an interest in
Aeronautics and Air Transport Tickets available NOW
at www.aerodays2015.com



TOMORROW'S AIRCRAFT INTERIORS INDUSTRY IN THE MAKING



REGISTER NOW

**THE ONLY DEDICATED
AIRCRAFT INTERIORS EVENT
IN THE AMERICAS REGION**

Aircraft Interiors Expo Americas 2015
Washington State Convention Center,
Seattle 4 - 5 November 2015

**SCAN TO SAVE
THE DATE**



For more information
www.aircraftinteriorsexpo-us.com/register_FI

Organised by:





Distance learning
FEATURE P26

LAUNCHERS DAN THISELL LONDON

Orbital ATK fired up to deliver goods

Merged group bullish on earnings as ULA supply deal helps secure its future and bridges gap to Antares return to flight

Back in April 2014, when Orbital Sciences and ATK announced plans for an all-stock merger, the move looked like the proverbial marriage made in heaven – or at least a tie-up destined for the stars.

At that time, Orbital's chief executive, David Thompson, who now heads the combined company, described a "merger-of-equals" that would bring together "innovative developers and cost-efficient manufacturers who have worked closely together for over 25 years" with "complementary technologies, products and know-how and highly compatible cultures".

Indeed, ATK's focus was solid rocket motors, satellite systems and composite structures, while Orbital's expertise lay in satellites and small launch systems – including missile interceptors and the three-stage Pegasus air-launched rocket. Orbital also makes a larger rocket, Antares, developed to push Orbital's own Cygnus unmanned supply capsule to the International Space Station, as contracted to NASA.

Moreover, the logic for the merger was, and remains, compelling, given the earthquakes rattling the two companies' domains of business. With US defence spending in a long-running downturn and Elon Musk's start-up SpaceX lighting a competitive rocket under a launch industry already facing a cost and revenue squeeze, presumptions of viability in business as usual seem ill advised.

Then, an Antares rocket exploded.

The spectacular 28 October 2014 failure – just metres off the ground at Wallops Island, Virginia – destroyed an ISS-bound Cygnus capsule and left the launch pad and surrounding infrastructure in a rather bad way. The rocket and spacecraft alone, not including cargo, were worth some \$200 million, a cost to be shared by NASA and Orbital.



Not as big a disaster as it looks

Such things happen in spaceflight, but fortunately no-one was injured and while the incident and financial hit failed to derail the merger, it did delay its completion by a month, to the end of January 2015.

So while nothing is certain in the launch business until the payload has been delivered, the company now known as Orbital ATK is clearly encouraged by recent events. For the first six months of 2015, revenue edged up 2% to \$2.25 billion, but operating profit surged by nearly a third to \$248 million; results Thompson describes as "excellent", boosting the earnings outlook and underpinning new investment.

The logic for the merger... remains compelling, given the earthquakes rattling the two companies' domains of business

And now, the company has tied up a major supply deal with the big name in the US launch industry, United Launch Alliance (ULA), to develop new solid rocket boosters for its venerable Atlas V launch vehicle and the modular Vulcan that will replace

it – and eventually its bigger Delta IV stablemate – from about 2019. That deal puts Orbital ATK alongside Blue Origin, the space company started by Amazon billionaire Jeff Bezos, which is working with ULA to develop its BE-4 engines for Vulcan.

CONTRACTUAL OBLIGATION

Meanwhile, ULA is helping bridge the gap to Antares's return to flight. Soon after the Wallops explosion, one Atlas V flight was bought to meet Orbital's ISS resupply contract with NASA, and a second was bought when launch schedule imperatives heated up following the 28 June failure of an ISS-bound SpaceX Falcon 9.

As Orbital ATK's vice-president for flight systems strategy and business development Mark Pieczynski tells *Flight International*, the company's status as supplier, customer and competitor to ULA is "normal" in the launch industry. And, he adds, Orbital's space systems people have 30 years' experience integrating their own spacecraft with various launchers, so fitting Cygnus to Atlas V was not exceptional.

As for Antares, Pieczynski says refurbishment at Wallops should be complete this month, and preparations are under way there for a mission-length vertical stat-

ic firing in early 2016 of the rocket's two-engine first stage. Return to flight should follow.

Separately, he adds, Orbital ATK is awaiting a possibly imminent decision from the US Air Force that could see it win funding to work on an all-new launcher. One casualty of the sanctions tit-for-tat over the Ukraine crisis has been the Russia-sourced RD-180 engines used in Atlas V, so the USAF has been exploring ways to replace that engine while assuring access to space for national security launches – defined as having at least two launcher types available – and introducing competitive tendering for those launches.

For a decade now, US national security launch access has been guaranteed by the availability of Delta IV and Atlas V, whose makers, Boeing and Lockheed Martin, went on to pool resources and create the joint venture that is ULA.

Earlier this year, SpaceX won the right to compete for those launches in future, but its Falcon 9 rocket is only suitable for some missions; the bigger Falcon Heavy has yet to fly, so the USAF could well decide that Orbital ATK's proposed all-solid-fuel launcher is worth pursuing.

INTERESTING TIMES

Indeed, times are interesting in the launch business. A US Government Accountability Office report from August into USAF procurement strategies notes the appeal of competitive contracting, but concludes that "the ability of the federal government and the commercial launch market to sustain two or more launch providers is unknown at this time".

For its part, Orbital ATK is bullish. As Pieczynski puts it, the market includes US national security launches, ISS resupply, NASA civil applications and customers worldwide: "Our business case closes with a handful of launches [yearly]." ■

DISTANCE LEARNING

Reapers and Predators prowl the skies over US bases in New Mexico and Nevada, as personnel from several nations are trained to operate the unmanned aircraft

BETH STEVENSON HOLLOMAN AFB

The General Atomics Aeronautical Systems MQ-9 Reaper and MQ-1 Predator unmanned air vehicles are the backbone of the US Air Force unmanned surveillance fleet, and their use in multiple theatres demands a robust training schedule.

This is primarily carried out at Holloman AFB in New Mexico, a south west desert location that allows the UAVs to dominate the skies for some 12h every day. This facility is not a USAF-exclusive UAV training base, however, with all Reaper UAV operators passing through the training school at one point or another.

Trainees come from the UK – the Royal Air Force is the only other operator of the armed variant of the Reaper – France and Italy. The Netherlands is expected to soon join the group of Reaper operators and Australia and Germany are considering purchases, with the former having carried out training in 2015.

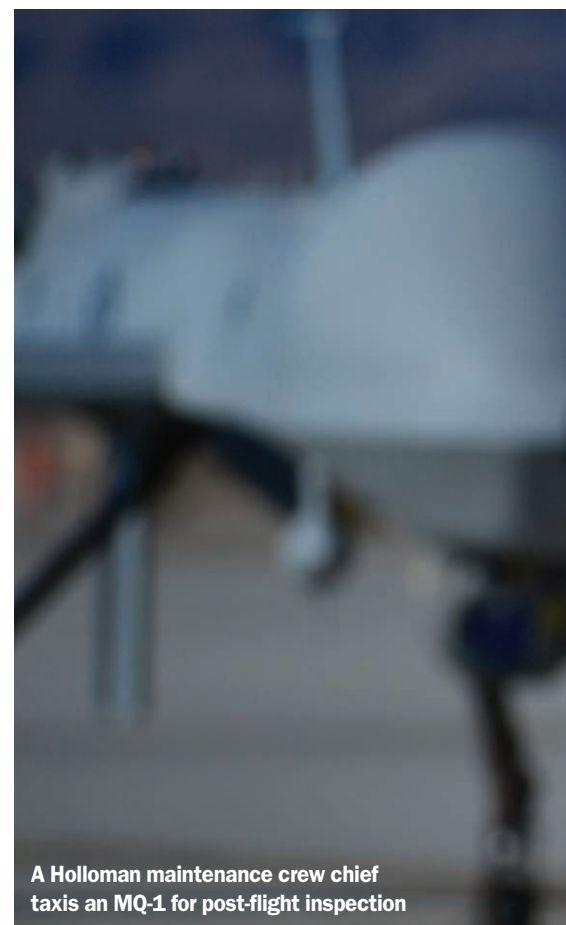
Training is led by prime contractor CAE, which has been providing this service, on and off, since 1998. Under the 49th Operations Group, the squadrons that are responsible for UAV training at Holloman are the 6th Reconnaissance, 9th Attack, 16th Training and 29th Attack squadrons.

PREDATOR

Creech AFB in Nevada, meanwhile, is the second biggest site for Predator training, and previously conducted all of the MQ-1 training until the USAF decided to split it up. All mission training is now carried out at Holloman, but the launch and recovery aspect of it remains at Creech.

“Because they are so difficult to fly, when the students come through here, they are mission qualified. This means they are qualified to do the mission in the aeroplane, but they are not qualified to launch it, and they are not qualified to land it,” the CAE lead at Holloman told a media briefing at the base in September.

That is a separate qualification for the air



A Holloman maintenance crew chief taxis an MQ-1 for post-flight inspection

force, and approximately one quarter of Holloman graduates will continue on to carry out this training.

There are two smaller sites that the Air National Guard owns, one at March AFB in California and one at Hancock Field in Syracuse, New York, which each run 80-100 students through mission training yearly.

These bases mainly train personnel for National Guard units.

“The contract air crew training and the coursework development – for this we basically support everything the air force does,” the CAE representative says. “We do all the contract aircrew training, which includes academic and simulator instruction. And, unique to this platform, we also do live instruction for the air force.”

This is a rarity, as the USAF typically carries out all pilot training – manned and unmanned – using military instructors.

The training for a pilot and sensor operator that have been paired up is some 4.5 months, while the whole process, from flight screening through to graduating as a mission-qualified crew, is approximately a year. Prior to moving to Holloman, trainees undergo screening and undergraduate training at Pueblo, Colorado and Randolph AFB in Texas.

The course receives both trainees that have previous manned aviation experience and



UAV pilots at the controls at Creech AFB, Nevada



US Air Force

non-pilots that have never flown before. Some 10-15% have an aviation background, while the rest are new to the discipline.

Approximately 800 students – pilots and sensor operators – are expected to graduate from Holloman in 2015, which will include an increase of 80 pilots since 2014.

REAPERS

Roughly two-thirds of the training takes place on Reapers and the rest on Predators, and between eight and 10 aircraft per day are flown

for a period of around 12h. Although the training is managed by CAE, the Predator Mission Aircrew Training System simulator that is used at Holloman is built by L-3.

Holloman benefits from being near Ft Bliss, a US Army base. Exercises can be carried out with the UAVs from Ft Bliss to demonstrate how ground troops, for example, can act in concert with the unmanned systems in different scenarios.

By the time students graduate, 90% of personnel will have dropped an inert GBU-12

Paveway bomb from the Predator, and occasionally a Lockheed Martin AGM-114 Hellfire will be fired at neighbouring Ft Bliss, but the training is primarily focused on operating the aircraft. The availability of restricted airspace was behind the reason for basing the Predator/Reaper training at Holloman, as was its location near to the army range.

MQ-1s will be phased out by 2018, the air force recently announced, and a USAF representative at Holloman says the service is currently in the process of assessing how this phase-out will happen with the training alongside the operational aircraft.

The training to pair up a pilot and sensor operator takes about four and a half months

CAE

Prime contractor, UAV training for the US Air Force

The UAVs that are flown in the training missions from Holloman are typically the aircraft located at the site, but this does not have to be the case. A maintenance problem in 2014 with the MQ-1 led to Holloman trainees operating aircraft from Creech, for example.

A US Government Accountability Office (GAO) report released in May claimed that more needed to be done to increase the Department of Defense's UAV pilot training. One criticism was that the shortfall of instructors was affecting readiness, which the USAF appears to be addressing.

"Holloman is in a growth phase right now, both with the military and CAE," the company says. "A year ago we probably had 60-65 instructors supporting the air force, and we now have about 85. There is likely to be a similar trend for this year and next for the air force personnel."

"We are here because of the needs of the air force, so I guess you can make that correlation >>



Bert Stevenson/Flightglobal

New Mexico-based MQ-9 Reapers can participate in mission training with US Army troops stationed at neighbouring Ft Bliss

LOYALTY 2016

Millenium Hilton, Bangkok, Thailand, 29th February – 2nd March 2016

Since our first loyalty conference in 2005, the travel loyalty market has evolved in many ways – what hasn't changed is the need for high-level events unifying key loyalty professionals from all over the world, so join us in Bangkok for Loyalty 2016.

CONFIRMED SPEAKERS INCLUDE :

Charamporn Jotikasthira
President
Thai Airways

Sachin Pande
Director, Global
Marketing
PAYBACK

Wee Kee Ng
Vice President
Loyalty & Partner
Marketing
Shangri-La

Nik Laming
General Manager
Loyalty
Cebu Pacific

Meaza Taye
Regional Manager
Thailand & SEA
Ethiopian Airlines



Visit our
new look
website

Official Airline Partner:



» that the GAO report caused the air force to increase the numbers in their training environment.” A contract modification was awarded to CAE in August to supply the additional training at Holloman, and the number of instructors in 2016 is set to increase to 100, the company says.

A year ago, a syllabus revamp for MQ-1 and MQ-9 was authorised. This was done before the GAO report was released, but the air force claims that the syllabus is in line with training requirements. Instructors are made up of some 35-40% CAE contractors and the rest USAF personnel.

RIPPLES

When new features are introduced to either aircraft, this “ripples through the training” so that the courses are up to date without having to completely revamp the syllabus, CAE says.

The company began offering this training in 1998, and is now three years into a five-year contract to run the training at Holloman. This was awarded after a five-year gap in providing the training, between 2008 and 2013.

CAE anticipates that it will bid again for the contract when it comes up for renewal, maintaining that it is the only contractor that can offer the training on this scale.

“Based on the experience and demonstrated performance we have, we can show up in any nation and build them an RPA [remotely-piloted aircraft] training centre from scratch because we’ve done it all,” the company representative argues. “We have instructors with the expertise and we can build the simulator for a complete RPA set up.”

There are also overseas instructors involved, with British instructors based at Holloman at present. Less than 10% of the training is allocated to foreign air forces, CAE and the air force say, but they would not divulge how the schedule is divided when allied forces train, and if it affects US training.



USAF personnel carry out maintenance on one of the Reapers based at Holloman

The Netherlands, which has received authorisation from the US government for export but has yet to place a firm order for the aircraft, has training slots allocated for next year, the USAF says, which comes under its fiscal year 2016 planning.

CAE’s Gene Colabatistto, group president of defence and security, says that the company wishes to replicate the UAV training that it offers at Holloman to other nations by developing “centres of excellence” in different regions.

“If I could do more, I’d do more with the Predator – I haven’t saturated the market”

GENE COLABATISTTO

CAE group president, defence and security

“The strategy is that we want to be aligned with the Predator,” Colabatistto says, adding that there is an opportunity in every region – plus more in the USA – and that CAE has locations for these in mind.

SIMULATORS

Italy is the first operator nation to acquire a simulator for its Predator fleet, suggesting Rome could be pursuing an intention to establish itself as a European centre for training.

“If we create a greater capability in Italy, for example, that’s less training here [at Holloman],” Colabatistto says. “If I could do more, I’d do more with Predator – I haven’t saturated this market yet.”

“We anticipated growth, established an agreement with General Atomics and developed a product line.”

The United Arab Emirates, meanwhile, is in the process of acquiring the export-specific XP variant of the Predator, and while the training for this is yet to be negotiated, it is understood that it will require an in-country mission simulator.

Germany and Australia are both considering Predator purchases through ongoing programmes to modernise their Israel Aerospace Industries Heron UAV fleets, and CAE is eyeing potential in these markets.

Australia carried out some training at Holloman in February, in what it described as an effort to increase its air force’s understanding of complex UAV operations. Five people training to be MQ-9 air vehicle and payload operators deployed to Holloman, and one communication systems engineer deployed to Creech. ■



A Predator (left) and Reaper assigned to the 432nd Wing taxi for takeoff from Creech



FEAR OF FLYERS?

As UAVs prove their worth in civil applications – and feature in a growing list of incidents – it's no surprise to find rising demand for formal operator training

BETH STEVENSON LONDON

In its shake-up of the regulations governing unmanned air vehicle operations, the European Aviation Safety Agency has proposed that pilot training and licensing be incorporated into its future rule making.

A new, risk-proportionate set of regulations from the authority could transform optional national-level qualifications into mandated, European-recognised UAV operator training,

as is the case with manned aviation. “The UK CAA [Civil Aviation Authority] oversees the licence to operate in that [manned] environment, so you are a registered, approved CAA training school,” says Neil Williams, operations and training manager at UK-based UAV training company Resource Group.

“Critically, the licence number is a European one, so you operate in a European environment and your qualification, delivered in the UK, is recognised Europe-wide.”

Incidents over the past year involving UAVs being operated too close to manned aircraft, infrastructure and crowds of people, have led to calls for tighter regulation.

Offensive technologies to stop UAVs getting too close to prohibited areas – such as geo-fencing and surveillance systems that can jam a UAV's control link – are being developed. However effective, they are crude filters, so clarification of the level of pilot qualification required to operate where UAVs pose

a risk would be helpful.

Resource Group has focused its training regime on those who want to make a living out of flying. Courses include theoretical work online and two days of live training with a formal assessment. The company also helps pilots develop an operations manual for tasks they wish to carry out with the aircraft.

REGULATION

In the UK, permission can be granted by the CAA for commercial aerial UAV work, and while training is not a legal requirement, qualifications such as those offered by Resource Group make permissions easier to come by.

The UK's Air Navigation Order, CAP 393, dictates rules for users of small UAVs, of less than 20kg (44lb). The aircraft must, for example, remain in the operator's line of sight and must not endanger the public: “The person in charge of a small unmanned aircraft must maintain direct, unaided visual contact with

UAVs are proving valuable for tasks such as precision crop spraying



Resource Group is ready to scale up its pilot training to operators of large – over 20kg – UAVs

where do larger platforms sit and who is going to legislate them in the future?”

The fundamental difference between smaller and larger platforms is that above 20kg a platform is subject to continuing airworthiness issues and maintenance programmes carried out by qualified engineers. For platforms under 20kg, operators do not need a maintenance programme or certificates, or even an airworthiness certificate.

RAMP UP

Williams says Resource Group could “absolutely” ramp up training for operators of larger UAVs, and could utilise its expertise in training manned aircraft engineers, specifically for airliners. “Resource Group has existing skill bases, and could extend from small, hobbyist drones into what is more recognisable as a ‘proper aeroplane’.”

But Williams sees a skills gap among would-be UAV operators. He says 95% of can-

“There are very few places [worldwide] where you can fly with impunity”

NEIL WILLIAMS

Operations and training manager, Resource Group

didates coming to Resource Group with aspirations to operate UAVs commercially have no aviation experience.

Williams reckons most people are capable of passing the examination, but some do not have the flying skills and fail the formal assessment. In these cases, Resource Group will not allow their paperwork to be presented to the CAA.

“We advocate it [the training] and if you want permission for aerial work from the CAA – which is your ticket to present to a customer to say ‘I am approved’ – having the training is important,” Williams adds.

“The global market is inconsistent... but nobody has ignored it, and there are very few places where you can fly with impunity.”

In the USA, training is not mandated by the Federal Aviation Administration, but is becoming more popular as commercial operations of unmanned systems proliferate. One company offering courses is the Unmanned Vehicle University, in Arizona, which started schooling UAV pilots in 2012.

University staff have aeronautical experience ranging from manned platforms such as the Lockheed Martin F-16, to unmanned aircraft like the General Atomics Aeronautical Systems MQ-9 Reaper and Northrop Grumman RQ-4 Global Hawk. Provost John Minor says: “We believe that we’re doing everything the FAA has said that it will probably want in the future, based upon... the proposed rules for the operations of small UAS.”

The course is split into three parts, starting with 16-18h of home-based online classroom training, followed by about 10h of simulator

the aircraft, sufficient to monitor its flight path in relation to other aircraft, persons, vehicles, vessels and structures for the purpose of avoiding collisions,” the regulation states.

Cap 722, meanwhile, is a guidance document for UAV operations. It does not specify formal flying qualifications for operators.

“The requirements for the licensing and training of UK civil remote pilots have not yet been fully developed,” it says. “It is expected UK requirements will ultimately be determined by ICAO Standards and Recommended Practices and EASA regulations.” Cap 722 adds that until the regulations are formalised, the UK will determine the requirements for flight on a case-by-case basis. Special allowance is required for commercial work.

“UK schools are not allowed to offer permissions above 20kg,” Williams explains. “The above-20kg category in the UK is governed by the same rules as manned aviation. Indeed, one of the points of discussion is,



Staff from the UK's AAIB used UAVs at the site of the Shoreham air show crash

» work, again at home and on a system provided by the university, which simulates many different unmanned and manned aircraft types, both fixed and rotary wing.

INSTRUCTORS

Finally, students spend two days with flight instructors, at any of a number of locations around the USA.

"It is recognised by some employers that a student has gone to this level, but the FAA doesn't have any published certification, rules or standards for it, and you can't get an FAA certificate like you can a pilot's licence today," Minor adds.

"We're still hoping for that to come out, and we hope it will come out in 2016 or not later than early 2017."

Possible employers range from defence contractors to small companies that want to offer UAV services such as pipeline monitoring, electrical power grid inspection and precision agriculture. Says Minor: "The FAA is granting 333 exemptions that allow people to fly these drones commercially in order to be able to do this, but they have to go through that 333 exemption process.

"Under the 333 exemption, they require the pilots to have a sports pilot's licence, the lowest level of private licence that you can get, but whether or not they are going to continue that in the future remains to be seen."

A specific operator's licence could be an option in the future instead of a pilot's licence, but for now the 333 exemption is the ruling on UAV operations and qualifications.

Minor adds that the pass rate is very high: "It is seldom that somebody cannot master the skills to pass."

Besides pilot training, the university also has a graduate school that offers masters degrees and doctorates in unmanned systems engineering. There is also a four-course programme that leads to a vocational certificate.

One customer is Rob Hannaford, who after training returned home to South Africa where he set up a company called UAV and Drone Solutions – using UAVs carrying infrared cameras in a bid to thwart elephant and rhino poachers.

Minor says he is in discussions that could see the university expand further with international clients, probably in Europe and South Africa: "I would say some time in 2016 we will be tapping into that market."

SPECIALITY COURSES

He adds: "In addition to the traditional unmanned systems engineering courses that we're teaching, we're going to start adding more speciality courses, including on the academic side and the flying side.

"At the moment the training we're doing is just small systems pilot training, but in the fu-



In Tianjin, UAVs helped inspect damage from the August 2015 warehouse explosions

Xinhua/Rex Shutterstock

"I really see the commercial side taking over more – the professional videographers"

JOHN MINOR

Provost, Unmanned Vehicle University

ture we'd probably expand to some larger aircraft and into specific missions, like teaching people how to carry out precision agriculture, or the very specifics or how to do search and rescue or inspect power lines."

This will involve employing mission-specific experts to carry out the training, he says.

One example of mission-specific training that the university already does is with the military, including with the US Navy Seals, although Minor could not provide any more detail.

However, the university envisages the real growth area to be on the commercial side: "I really see the commercial side taking over more – the professional videographers and the people carrying out services with UAVs that are cheaper than with manned aircraft.

"That's really where the explosion is going

to be. The military is not going to give up on UAVs for a while; they're always going to be around so there will be opportunities, but we really want to service and focus on the growth of the commercial industry."

Minor's optimism about the growth potential of civil-focused UAV flight training stems from a realisation in the industry and among regulators that unmanned system operators have as much need to be formally qualified as do pilots of traditional, manned aircraft.

As for fears about the proliferation of "drone" technology, he adds that while there are always people that will use a rapidly developing and accessible technology such as this maliciously, there are far more that will want to use it for commercial reasons – just as they do with manned aircraft.

"There's a lot of fear out there with the public and the unknown, and fear that it is going to be used for bad purposes," Minor explains. "Criminals of course are going to get hold of it and use it for their purposes.

"But that's the small percentage – the 1-2%. The other 98% of people want to use it for the good of mankind." ■

From yuckspeak to tales of yore, send your offcuts to murdo.morrison@flightglobal.com

More than a few of the few

Denis Calvert captured this magnificent formation – no fewer than 17 Spitfires in the air together – at Duxford's Battle of Britain anniversary air show, held in September.

"This was a sight unlikely ever to be repeated," says Denis, who notes: "And there's not a single BBMF [Battle of Britain Memorial Flight] Spitfire among them." Its four examples were displayed separately.

Oz-mosis

Australia has not had the best of times when it comes to military procurement. Numerous programmes, particularly helicopters, have turned into the sort of expensive headaches that us journalists love.

Faced with a clear relationship between the level of customisation on the platform and how late it is, when Canberra ordered MH-60R Seahawks in 2011 it went for essentially an off-the-shelf product. Or as Rear Adm Tony Dalton, head of helicopter purchases for the Australian Defence Organisation, put it at a recent conference: "The only difference from the ones the US Navy operates is that we paint Skippy on the side of the aircraft."



All you need to be Australian



"Job well done, lads. Home for bacon and eggs"

Entschuldigung!

Peter Davies has a formidable reputation as a turnaround specialist, having being parachuted in over the years to take charge of troubled carriers such as Air Malta, Caribbean Airlines and SN Brussels.

However, asked at a recent Aviation Club luncheon – where he was guest speaker – what he would tell Angela Merkel if she sought his advice about sorting out Volkswagen and Lufthansa, he quipped: "I'd say I'm busy."

All relative

It looks like Icelandic airline Wow Air is taking a family approach to its fleet strategy, judging by registrations for four of its aircraft:

TF-MOM
TF-DAD
TF-BRO
TF-SIS

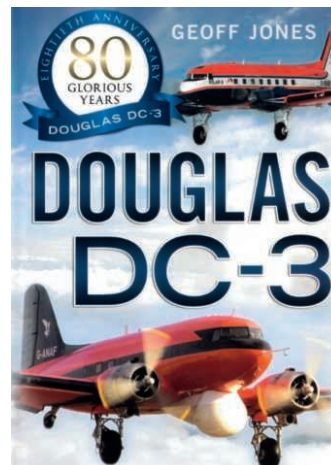
Hail The Dug

Geoff Jones's latest book *Douglas DC-3* celebrates "80 glorious years" of one of aviation's most prolific and enduring types. It was said as late as the 1960s that the best replacement for a DC-3 was a DC-3, and with some justification: the aircraft is still in service today.

Including well over 100 photographs – dozens in colour

– Jones charts the history of the twinprop from its evolution in the 1930s, as one of a number of aircraft competing for the attention of the USA's emerging transcontinental airlines, through its war service as the C-47, and into myriad uses around the world in recent decades as a commercial transport, utility aircraft and collector's item.

Although scant on detail about the programme's development – there are no technical drawings, for instance – the book makes up for it in its encyclopaedic outlining of the Dug's service history, with chapters on conversions, missionary aircraft, versions used by the Axis powers and the type's operators in Latin America and Europe. £20 (\$34.95) fonthillmedia.com



Railway attacked

A squadron of aeroplanes today dropped 72 bombs on the railway station of Guignicourt. The bombardment appears to have been very effective. The aeroplanes were violently cannonaded, but returned in safety to their base.

100 YEARS AGO

Hurricanes harry

On Sunday, September 29, the raiding was sporadic and not heavy, though many parts of the country were visited. One attack on Liverpool was neatly frustrated by a full squadron of Hurricanes.

75 YEARS AGO

Satellite signals

Direct-broadcast satellites capable of transmitting directly to conventional home FM and/or shortwave radio sets are the subject of feasibility studies to be carried out for NASA. Proposals from industry have been requested for two alternative types of spacecraft, which would transmit in the HF and FM bands respectively.

50 YEARS AGO

Embargo breached

British and Belgian companies have been modifying and overhauling Libyan aircraft in apparent defiance of a US embargo.

25 YEARS AGO

Several Libyan aircraft, including a Lockheed L-100 Hercules transport, have been worked on at Ostend, while other Libyan Hercules apparently are being overhauled in France.

100-YEAR ARCHIVE
Every issue of *Flight* from 1909 onwards can be viewed online at flightglobal.com/archive

FLIGHT INTERNATIONAL

We welcome your letters on any aspect of the aerospace industry.

Please write to: The Editor, Flight International, Quadrant House, The Quadrant, Sutton, Surrey, SM2 5AS, UK. Or email flight.international@flightglobal.com

The opinions on this page do not necessarily represent those of the editor. Letters without a full postal address supplied may not be published. Letters may also be published on flightglobal.com and must be no longer than 250 words.

Put statistics into perspective

In your article "Making sense of accident statistics" (*Flight International*, 8-14 September), you write about the perception of numbers in accident statistics.

I say the arguments apply to accident statistics overall. We continue to focus on accidents per million departures on a yearly basis. Conclusions are drawn on 'safest region, safest year, etc'. Anyone with basic statistical knowledge will tell you these conclusions are completely meaningless. The actual accident numbers are now so low that moving a single accident by a week (across 31 January, or a quarterly line) will shift statistics by double-digit percentage points. That invalidates the statistical method.

For general aviation, this was recognised, but we are looking at flight hours. Not a very good statistic as accidents tend to be on take-off and landing, making per flight more meaningful.

Why tunnel on the 'yearly' statistics? It's time we move to a rolling 10-year window. Statistics will then become relevant again and safety trends can still be effectively visualised.

Name and address withheld

Blown off course

In your *Flight International* 15-21 September issue, I was surprised to read that the National Transportation Safety

STRATEGY

Suborbital tourism could rocket

Your Comment 'To infinity, and... hold on!' (*Flight International*, 22-28 September) implies that the Virgin Galactic small satellite launcher is a better business proposition than the company's suborbital tourism efforts. The potential demand for brief space experience flights is orders of magnitude greater than that for launching satellites. At present there are only about 100 launches a year, which compares with about 40 million scheduled airliner flights, and the \$1 trillion spent each year on tourism is over 1,000 times more than that spent on small satellite launches. Early suborbital passenger flights, at about \$250,000 per seat, will be beyond the reach of most. However, with economies of scale and maturing technology, this should fall to a few thousand dollars. We cannot predict accurately how many people will wish to visit space at this cost, but we can be sure that the revenues will be far greater than those from launching small satellites.

The North American X-15 was making regular suborbital flights 50 years ago. History shows that the typical time between an advanced research and routine operation of vehicles with comparable performance is about 10 years, if there is a demand. On this basis, suborbital passenger carrying could have started 40 years ago.

David Ashford
Bristol, UK



\$250,000 a seat on Virgin Galactic

Board (NTSB) is examining the effects of crosswinds on the recent British Airways Boeing 777 fire at McCarran airport, Las Vegas. The prime focus must be the trigger cause, namely the high-pressure compressor disc uncontained failure. It is apparent that the failure happened near or during take-off power. Such a failure drives violent shaking that causes exterior plumbing to shear, thus severing the fuel lines at the hot section during near maximum fuel flow. Hence the fire.

After that it really does not matter which direction the wind is blowing. Needless to say 8kt winds are normal at airports.

It remains to be said, uncontained engine failure and hull breach is one of the greatest threats to extended twin-engined operations aircraft, which will most likely involve a rapid airworthiness directive to rectify this failure mode.

Chris Barnes
Charleston, South Carolina, USA

Blatant blunders put lives at risk

Your coverage of the accident report into the Aeromexico Boeing 767-200 tailstrike at Madrid (*Flight International*, 1-7 September) is yet another shocking reminder of how incompetent some pilots have become thanks to automation – in all its forms.

First off, it has to be said that it is unbelievable a type-rated captain would ever accept a 118kt (219km/h) rotation speed for a 767 loaded with passengers, fuel and baggage/freight about to take-off on a 5,000-mile transatlantic flight.

Of course he didn't do the actual computation – his dispatcher in Mexico City did – but any pilot with half a brain, and even a minimum time in the aircraft, should have instantly recognised the provided speed as ludicrously low.

This isn't just a mistake, or an error in judgment, it is manifest

evidence of malfeasance that is so severe as to justify the permanent suspension of his (or her) captaincy.

Furthermore, when the aircraft refused to do what it was being forced to do – lift off at an airspeed far too low to become airborne – the pilots, who should have aborted, continued the take-off.

They did so, even when experiencing a tailstrike so serious as to result in the aircraft being later written off.

It is incredibly fortunate that a crash did not occur.

I am struggling to come up with an adequate word to describe these "pilots" – but whatever it is, it is not "airmen".

They should both be driving buses instead of airplanes, but doubtless their union will prevent them from being fired. These pilots will no doubt be "retrained" instead.

My only conclusion from all the above, is to never fly with Aeromexico.

Chris Skillern
San Diego, California, USA

Nose firmly out of [Rivet] joint

I would be over the moon if you could persuade your journalists to stop using that silly expression – Rivet Joint – to describe an aircraft type. In your issue, *Flight International*, 15-21 September, you refer to a Boeing RC-135W Rivet Joint.

This demonstrates how little the journalist knows about aircraft.

Ralph Hudson
Huddersfield, UK



What's in a name?

EDITORIAL, ADVERTISING, PRODUCTION & READER CONTACTS

EDITORIAL +44 20 8652 3842

**Quadrant House, The Quadrant,
Sutton, Surrey, SM2 5AS, UK**
flight.international@flightglobal.com

Editor Craig Hoyle
+44 20 8652 3834 craig.hoyle@flightglobal.com
Deputy Editor Dominic Perry
+44 20 8652 3206 dominic.perry@flightglobal.com
Head of Strategic Content Murdo Morrison FRAeS
+44 20 8652 4395 murdo.morrison@flightglobal.com
Features Editor Dan Thisdell
+44 20 8652 4491 dan.thisdell@flightglobal.com
Business & General Aviation Editor Kate Sarsfield
+44 20 8652 3885 kate.sarsfield@flightglobal.com
Aerospace and Defence Reporter Beth Stevenson
+44 20 8652 4382 beth.stevenson@flightglobal.com
Consulting Editor David Learmount
+44 7785 901787 david.learmount@btworld.com
Magazine Enquiries Dawn Hartwell
+44 20 8652 3315 dawn.hartwell@flightglobal.com

AIR TRANSPORT TEAM

Editor Flightglobal Premium News Graham Dunn
+44 20 8652 4995 graham.dunn@flightglobal.com
Managing Editor Niall O'Keefe
+44 20 8652 4007 niall.okeefe@flightglobal.com
Air Transport Editor David Kaminski-Morrow
+44 20 8652 3909 david.kaminski-morrow@flightglobal.com
Air Transport/MRO Reporter Michael Gubisch
+44 20 8652 8747 michael.gubisch@flightglobal.com
Senior Reporter Oliver Clark
+44 20 8652 8534 oliver.clark@flightglobal.com

AMERICAS

Americas Managing Editor Stephen Trimble
+1 703 836 8052 stephen.trimble@flightglobal.com
Deputy Americas Editor - Air Transport Ghim-Lay Yeo
+1 703 836 9474 ghimlay.yeo@flightglobal.com
Air Transport Reporter Edward Russell
+1 703 836 1897 edward.russell@flightglobal.com
Air Transport Reporter Jon Hemmerdinger
+1 703 836 3084 jon.hemmerdinger@flightglobal.com
Aviation Reporter James Drew
+1 703 836 7442 james.drew@flightglobal.com

ASIA/PACIFIC

Asia Editor Greg Waldron
+65 6780 4314 greg.waldron@flightglobal.com
Asia Air Transport Editor Mavis Toh
+65 6780 4309 mavis.toh@flightglobal.com
Asia Finance Editor Ellis Taylor
+65 6780 4307 ellis.taylor@flightglobal.com
Reporter Aaron Chong
+65 6780 4851 aaron.chong@flightglobal.com

EUROPE/MIDDLE EAST

Israel Correspondent Arie Egozi

FLIGHTGLOBAL.COM

Editor Stuart Clarke
+44 20 8652 3835 stuart.clarke@flightglobal.com
Web co-ordinator Rebecca Springate
+44 20 8652 4641 rebecca.springate@flightglobal.com

EDITORIAL PRODUCTION

Head of Design & Production Alexis Rendell
Global Chief Copy Editor Lewis Harper
Chief Copy Editor, Europe Dan Bloch
Layout Copy Editors Max Hall, Sophia Huang, Tim Norman
Global Production Editor Louise Murrell
Deputy Global Production Editor Terence Burke
Deputy Digital Producer Damion Diplock
Web Production Editor Andrew Costerton
Senior Designer Lauren Mills
Consulting Technical Artist Tim Hall

DISPLAY ADVERTISEMENT SALES

**Quadrant House, The Quadrant,
Sutton, Surrey, SM2 5AS, UK**

EUROPE

Global Sales Manager Mark Hillier
+44 20 8652 8022 mark.hillier@flightglobal.com
Key Account Manager Grace Hewitt
+44 20 8652 3469 grace.hewitt@flightglobal.com
Sales Support Gillian Cumming
+44 20 8652 8837 gillian.cumming@rbi.co.uk

NORTH & SOUTH AMERICA

Vice-President, North & South America
Rob Hancock +1 703 836 7444
robert.hancock@flightglobal.com
Regional Sales Director
Warren McEwan +1 703 836 3719
warren.mcewan@flightglobal.com
Sales Executive Kaye Woody
+1 703 836 7445 kaye.woody@flightglobal.com
Reed Business Information, 333 N. Fairfax Street,
Suite 301, Alexandria, VA 22314, USA

ITALY

Sales Manager Riccardo Laureri
+39 (02) 236 2500 media@laurerassociates.it
Laureri Associates SRL, Via Vallazze 43,
20131 Milano, Italy

ISRAEL

Sales Executive Asa Talbar +972 77 562 1900
Fax: +972 77 562 1903 talbar@talbar.co.il
Talbar Media, 41 HaGiva'a St, PO Box 3184, Givat
Ada 37808, Israel

ASIA/AUSTRALASIA

Key Account Manager Jay Ee
+65 6780 4301 jay.ee@flightglobal.com
Fax: +65 6789 7575
1 Changi Business Park Crescent,
#06-01 Plaza 8 @ CBP, Singapore 486025

RUSSIA & CIS

Director Arkady Komarov
komarov@worldbusinessmedia.ru
Tel/Fax: +7 (495) 987 3800
World Business Media, Leningradsky Prospekt, 80,
Korus G, Office 807, Moscow 125190, Russia

CLASSIFIED & RECRUITMENT

Sales Manager Sophie Wild
sophie.wild@rbi.co.uk
Recruitment & Classified Key Account
Executive Katie Mann
+44 20 8652 4900
Recruitment.services@rbi.co.uk
Recruitment & Classified Sales Executive
Stuart Lee +44 20 8652 4900
Classified.services@rbi.co.uk
Key Account Manager - Asia Jay Ee
+65 6780 4301

ADVERTISEMENT PRODUCTION

Production Manager Sean Behan
+44 20 8652 8232 sean.behan@rbi.co.uk
Production Manager Classified Alan Blagrove
+44 20 8652 4406 alan.blagrove@rbi.co.uk

MARKETING

Marketing Director Justine Gillen
+44 20 8652 8031 justine.gillen@flightglobal.com

DATA TEAM

Head of Data Pete Webber
+44 20 8564 6715
peter.webber@flightglobal.com
Commercial Aviation Steven Phipps
+44 20 8564 6797
steven.phipps@flightglobal.com
Fleet Research Manager John Maloney
+44 20 8564 6704
john.maloney@flightglobal.com

PUBLISHING MANAGEMENT

Chief Operating Officer
Philippa Edward
Executive Director Content
Max Kingsley-Jones
max.kingsley-jones@flightglobal.com
Publisher Stuart Burgess
stuart.burgess@flightglobal.com

READER SERVICES

Subscriptions

Jenny Smith
Flight International
Subscriptions, Reed Business Information,
PO Box 302, Haywards Heath,
West Sussex, RH16 3DH, UK



Subscription Enquiries

From UK: 0330 333 9533
From overseas: +44 1444 475 682
Fax +44 1444 445301
flightinternational.subs@quadrantsubs.com

Subscription Rates

1 Year: £141/\$225/€174
2 Years: £239.70/\$382.50/€295.80
3 Years: £338.40/\$540/€417.60
Only paid subscriptions available. Cheques
payable to Flight International

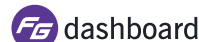
Flight International welcomes unsolicited contributions
from readers but cannot guarantee to return
photographs safely.

© and Database Rights 2015 Reed Business Information
Ltd. All rights reserved. No part of this publication may be
reproduced, stored in a retrieval system or transmitted in
any form or by any means, electronic, mechanical,
photocopying, recording or otherwise, without the prior
permission in writing of the publishers.



Ascend, a Flightglobal
advisory service, is a leading
provider of expert advisory
and valuations services to

the global aviation industry. Its specialist, independent
services inform and shape the strategies of aviation
businesses worldwide. Ascend offers an unrivalled
breadth and depth of aviation expertise and experience,
backed by unique access to robust industry data.
www.ascendworldwide.com Tel: +44 20 8564 6700
email: consultancy@ascendworldwide.com



Flightglobal's dashboard is a paid-for news and data
service for professionals who need to find new
opportunities or track competition within the air transport
industry. The service puts a wealth of global intelligence at
your fingertips, covering everything from airline fleets,
routes and traffic, through to aircraft finance, industry
regulation and more. **www.flightglobal.com/dashboard**



Flightglobal Insight provides a range of tailored research
reports and analysis, with access to information and
industry expertise from the unrivalled Flightglobal Premium
services portfolio. **www.flightglobal.com/insight**
Tel: +44 20 8652 3914 email: insight@flightglobal.com

Registered at the Post Office as a newspaper.
Published by Reed Business Information Ltd, Quadrant
House, The Quadrant, Sutton, Surrey SM2 5AS, UK.
Tel: +44 20 8652 3500.

Newstrade distributed by Marketforce (UK), 2nd Floor,
5 Churchill Place, Canary Wharf, London, E14 5HU, UK.
Tel: +44 20 3787 9001.

Classified advertising prepress by CCM.
Printed in Great Britain by William Gibbons and Sons Ltd.

Flight International published weekly 49 issues per year.
Periodicals postage paid at Rahway, NJ. Postmaster send
changes to Reed Business Information, c/o Mercury
International Ltd, 365 Blair Road, Avenel, NJ 07001

This periodical is sold subject to the following conditions:
namely that it is not, without the written consent of the
publishers first given, lent, re-sold, hired out or in any
unauthorised cover by way of trade, or affixed to, or as
part of, any publication of advertising, literary or pictorial
matter whatsoever. No part of the content may be stored
electronically, or reproduced or transmitted in any form
without the written permission of the Publisher.

ISSN 0015-3710 (Print) ISSN 2059-3864 (Online)

Part of rbi reed business
information



EVENTS

20-21 October

The Commercial UAV Show
ExCel, London, UK
terrapiinn.com/exhibition/
the-commercial-uav-show

26-28 October

Cargo Facts Symposium
Miami, USA
cargofactssymposium.com

8-12 November

Dubai Air Show
Dubai World Central
dubaiairshow.aero

12 November

Ascend West Coast: Finance
San Francisco, USA
flightglobalevents.com/
ascendwestcoast15

15-17 November

ALTA Airline Leaders Forum
San Juan, Puerto Rico
alta.aero/airlineleaders/2015

17-19 November

NBAA 2015
Las Vegas, USA
nbaa.org/events/bace/2015

17-19 November

Aerospace & Defense Meetings Torino
bciaerospace.com/turin

19-20 November

Safety In African Aviation
Kigali, Rwanda
2gether4safety.org

1-2 December

Military Airlift & Rapid Reaction Ops
Seville, Spain
smi-online.co.uk/defence/europe

8-10 December

Aerospace Meetings Brazil
bciaerospace.com/brazil

3-4 February 2016

Aircraft Interiors Middle East
Dubai World Trade Centre, UAE
aime.aero/welcome-to-aime-2016

16-21 February 2016

Singapore Air Show
Changi Exhibition Centre, Singapore
singaporeairshow.com

17-19 February 2016

Routes Americas
Puerto Rico
routesonline.com/events/178/
routes-americas-2016

6-8 March 2016

Routes Asia
Manila, Philippines
routesonline.com/events/180/
routes-asia-2016

26 March - 3 April 2016

FIDAE
Santiago, Chile
fidae.cl/en

5-7 April 2016

Aircraft Interiors
Hamburg, Germany
aircraftinteriorsexpo.com

18-21 April 2016

Defence Services Asia
Putra World Trade Centre, Kuala Lumpur
dsaexhibition.com



For a full list of events see
flightglobal.com/events

CLASSIFIED

TEL +44 (0) 20 8652 4897 **FAX** +44 (0) 20 8652 3779 **EMAIL** classified.services@rbi.co.uk

Calls may be monitored for training purposes

New and used aircraft



Gulfstream®
Independent Authorised Sales Representative for the United Kingdom

Tim Leacock
AIRCRAFT SALES LIMITED

+44 (0) 1258 818181 tim@timleacockaircraft.com jonathan@timleacockaircraft.com timleacockaircraft.com

SkyWorld
Aviation

The Regional Aircraft Marketing Specialist

Tel. + 44 1753 832088 info@skyworld.co.uk

Freighter aircraft available

Skyworld Aviation is marketing a variety of freighter aircraft for immediate sale / lease:

ATR 42-300 (Bulk Freighter)

ATR 72-202 (Class E)

CRJ 200 PF

Fokker 50 (LCD)

Saab 340A Cargo

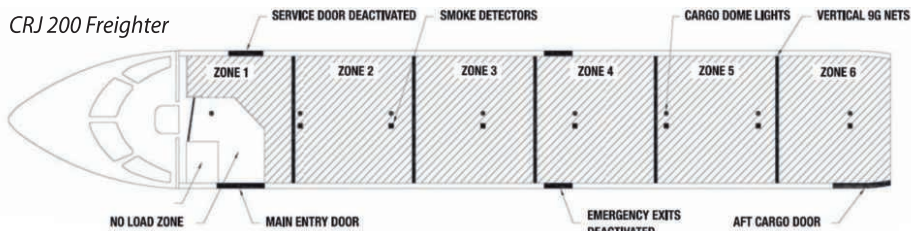
Saab 340B Cargo



Contact Patrick Leopold

patrick@skyworld.co.uk

Tel. + 44 1753 832088



www.skyworld.co.uk



Protect your Crew against the Risk of Fatigue

A Fatigue Risk Management System (FRMS) is a crucial safety system for airline operators. Our FRMS courses, delivered by Kathryn Jones, the UK CAA FRMS specialist, are designed to support Rostering/Safety Managers and those with an aircrew management remit.

- **Basic Introduction to FRMS**

Understand the use of fatigue metrics and risk treatment within an operation | London Gatwick 1-2 Dec 2015

- **Advanced FRMS – Understanding Effectiveness**

Learn to develop your own fatigue risk safety case and an effective reporting policy | London Gatwick 19-21 Jan 2016

Other featured courses include:

- AOC Accountable Manager
- SMS Overview for Managers
- Basic Intro to SMS
- Advanced SMS

To book now or for more information, please visit

www.caainternational.com/training

or contact us

T +44 (0) 1293 768700 or

E training@caainternational.com

A wholly owned subsidiary of the UK CAA



Courses and tuition



THROUGH COMPLIANCE TO PERFORMANCE

Fourth European Aviation Safety Symposium



3 - 4 NOVEMBER 2015 LONDON

BOOK NOW - VIP SPEAKERS CONFIRMED

Keynote Address **Mr. Kieron McFadyen** Executive Vice President Joint Venture Excellence, Shell

Join the debate and hear industry VIPs discuss why and how they are moving beyond regulatory compliance to safety performance



Find out more and book your places online at www.bainessimmons.com/symposium

RESERVE YOUR PLACES ONLINE
BOOK NOW

CRMT Crew Resource Management Trainer Core Course

The CRMT Core course is suitable for delegates who will be appointed CRM trainers for ground, simulator and line training. The course meets the CRM requirements of EASA, CAA and FAA.

The course covers all aspects of current CRM training, including instruction and facilitation techniques, debrief and feedback, NOTECHS and assessment. The course provides the student with the skills and materials to deliver professional CRM training for pilots and cabin crew.

Five day courses commence 2 Nov, 7 Dec, 11 Jan at Global Air Training. The course package includes comprehensive trainer manuals, presentations, resources and license for reproduction and use of the course materials within your airline. Refresher courses are 12 Oct, 14 Dec.

This course is attended by airlines from every continent of the world.

For more info and to book online,
Visit: www.globalairtraining.com

Ph: +44 (0)1829 771 334

Email: ops@globalaviation.com



Business services

AOG

URGENT

Dauphin parts in stock

alpine.aero
air support



Getting careers off the ground

flightglobal.com/jobs

EMAIL recruitment.services@rbi.co.uk CALL +44 (20) 8652 4900 FAX +44 (20) 8652 4877



Flightglobal Jobs

AVIATION CONNECTED

RECRUITMENT



Are you an experienced professional pilot with an interest in training?
Are you a people person who enjoys a professional team environment?
Do you have > 4000 hours with > 1500 hours of multi crew?

If so, CAE Burgess Hill (UK) are hiring Permanent, Full Time instructors and we provide excellent career progression and lifestyle benefits within a small friendly team.

What We Offer

Type Ratings on Modern Business Jets
SFI/SFE qualifications
Potential Package In Excess of £80K
Fixed Roster Pattern
Pension
Private Healthcare
32 Days Annual Leave
Additional "Flying" Days Off
Payments for working Days Off

The Business Aviation Training sector is expanding and requires pilots with a flexible and adaptable approach who will be focused on delivering the ultimate flight training experience for Business Aviation clients.

What We Want in Exchange

We expect a minimum 3-year full time commitment, after which freelance contracts will be available if preferred.

If you are looking for a new opportunity in our challenging and rewarding training environment where teamwork is key to our success, we want to hear from you. Please send your CV and a covering letter to: uk-recruit@cae.com quoting the source of this advert. We thank everyone for their interest but only successful candidates will be contacted.

Please see www.cae.com for other opportunities.

CAE is today a global leader in modelling, simulation and training for civil aviation and defence. The company employs approximately 8000 employees at more than 100 sites and training locations in approximately 30 countries. CAE offers civil aviation, military and helicopter training services in more than 45 locations worldwide and trains approximately 100,000 crew members yearly.

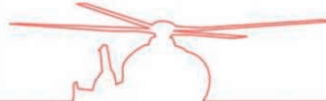


Line Pilot – Devon Air Ambulance – Salary c £55k (negotiable)

An exciting opportunity for an experienced helicopter pilot to join an organisation committed to providing an outstanding air ambulance operation in and around the county of Devon. With our roots firmly in the community we serve, the successful candidate will demonstrate not only a significant level of relevant overland helicopter experience but also a commitment to the values and ethos of the organisation.

Devon Air Ambulance owns and operates two modern EC135 T2/P2 helicopters from bases at Exeter Airport and Eaglescott Airfield in North Devon. Awarded our own AOC in March 2014, the successful candidate will join an operation that continually seeks to improve and is progressing to night flying operations in late 2016.

For full details of requirements and how to apply please download candidate briefing pack from daat.org/vacancies. DAATCL is an equal opportunities employer.



Devon Air Ambulance Trading Company Limited

Company Registration No 03876276



Thomas Cook Airlines

AIRBUS & BOEING PILOT RECRUITMENT

Thomas Cook Airlines are seeking applications from A320, A330, B757 or B767 type rated Pilots to commence work prior to May 2016. With 32 aircraft in the UK, Thomas Cook Airlines flies 6.7 million passengers a year to over 60 destinations. We are part of the 11th largest airline in Europe and are looking for pilots to fill First Officer or Senior First Officer positions.

You will need to possess professionalism, personality and loyalty but can expect excellent working conditions and a choice of routes/bases covering medium and short haul flying. There are also opportunities for long haul flying, mostly from our Manchester base. Rated pilots will have the opportunity of permanent, full-time contracts.

Should you wish to submit an application for a position, please apply online via our Thomas Cook Career's website using the following link: <http://careers.thomascok.com/search/>

Please follow the link to apply and enter the job reference 16181 in the Job number

Let's go!



executive flight services

• VIP flight deck & cabin crew • resourcing and management • international payroll • executive placements

flight@resourcegroup.co.uk
www.resourcegroup.co.uk/fcs

+41 (0) 41 76121 21



A photograph of a Jet2.com aircraft on a tarmac. The foreground shows the red nose and wing of a plane with 'Jet2.com Friendly Low Fares' written on it. In the background, another Jet2.com aircraft is visible, also with 'Jet2.com' and '22kg bag' on its side. A white ground support vehicle and an orange traffic cone are also on the tarmac.

Jet2.com
Friendly low fares®

Military Pilots – Leaving the Service?

UK Military Pilot Open Day – Sunday 18 October 2015

Jet2.com is the North's leading leisure Airline operating a fleet of **B737-800s & 300s** and **B757-200s**. We fly out of 7 Northern UK Bases including Leeds Bradford, Manchester, Glasgow, Newcastle, Edinburgh, East Midlands, Belfast as well as our Spanish Base in Alicante. Our flying includes our own scheduled services, flights for our package tour operator **Jet2holidays**, and charter flights for other airlines.

We recently announced the acquisition of 27 new aircraft from Boeing. The Next Generation B737-800 will be delivered over a 2 year period from September 2016 to 2018 to support our continued growth.

Jet2.com invites you to an Open Day for Qualified Military Pilots interested in their future beyond the Service. If you have or plan to have an ATPL, let us give you an insight into our Company and the life of a Pilot at **Jet2.com**.

What we offer you:

- ➔ **Industry-leading Training at our own Flight Training Centre**
- ➔ **Great Team spirit**
- ➔ **Great career progression opportunities**
- ➔ **Fully bonded Type Rating**

Why not register your interest at Jet2careers.com/Pilots to find out more?!

*Spaces are limited and your attendance will be confirmed after receipt of your registration request.

Interested? Apply online at Jet2careers.com



Emirates

Hello Tomorrow

Take command of your career

Fly an ultra-modern fleet and experience our expanding route network of over 140 destinations across six continents. You could be living in dynamic Dubai, earning a tax-free salary, with generous benefits and unmatched professional stability.

We're currently hiring pilots for our Airbus and Boeing fleets. If you have an ICAO ATPL, ICAO English level 4 certification or above, and experience flying jet or turboprop aircraft, attend one of our upcoming roadshows to find out more from our pilots themselves.

Information Sessions

Country	City	Date
Canada	Toronto	23-24 October
	Calgary	25-26 October
Australia	Melbourne	6-7 November
Spain	Madrid	20-21 November
	Barcelona	22-23 November

For more information, visit emirates.com/pilots

Where could you be tomorrow?

Flight crew

Flight Crew Services



- Commercial & VIP Recruitment
- Management Recruitment
- Temporary & Permanent
- Payroll

flight@resourcegroup.co.uk
+44 (0) 1256 368 500
www.resourcegroup.co.uk/fcs

Flight crew



Talk to us for the most exciting
Expat Pilot Jobs in INDIA

jobs@proctoraviation.com
www.proctoraviation.com
+91 22 6120 4400

Maintenance

Aviation Resourcing Services



- Maintenance Personnel
- Production Personnel
- Temporary & Permanent
- Global Reach

flight@resourcegroup.co.uk
+44 (0) 1638 672 880
www.resourcegroup.co.uk/ars

Engineering



**Strongfield
Specialist Aerospace
Personnel**

+44 (0)20 8799 8924 amehurst@strongfieldtech.com
www.strongfield.com



AeroProfessional

Aviation People Experts

- Recruitment Skills Insights
- Compliance Flight Ops Support

www.aeroprofessional.com

RECRUITMENT FOR THE AVIATION INDUSTRY



AVIATION SERVICES
Tel: +353 1 669 8224
Fax: +353 1 669 8201

Email: recruitment@sigmaaviationservices.com
www.sigmaaviationservices.com

Engineering



The preferred company for Stress (Fatigue & DT), GFEM, Composites), Aeronautical Research. Business units: Contract staff, Workpackages, Innovation and New Concepts, Aeronautical Research. www.bishop-gmbh.com
Contact bishop.peter@bishop-gmbh.com
Tel 0049-(0)40-866-258-10 Fax 0049-(0)40-866-258-20

Maintenance



Safe Hands
Aviation Recruitment

Call: +44 (0)1524 381 544
Email: info@safehand.aero
www.safehand.aero

you're in safe hands with us



Worldwide specialist for
Aerospace Engineering, Certification &
Management Services
E: yourcv@gdcengineering.com
T: +49 (0) 8153 93130
W: www.gdcengineering.com

Technical Recruitment Solutions



- Product & System Design
- Project Management
- Manufacturing & Supply Chain
- Engineering & Engineering Management

trs@resourcegroup.co.uk
+44 (0) 1905 368 576
www.resourcegroup.co.uk/trs

Start your job search today
flightglobal.com/jobs



Let your recruitment drive soar...

post your vacancies now
recruiters.flightglobal.com

AVIATION | AIRLINES | AEROSPACE



"Finding the right candidate at the right time can be a major challenge, but Flightglobal Jobs is a really useful channel to reach the best of the aviation talent pool."

European Business Aviation Association (EBAA)



**Flightglobal
Jobs**

WORK EXPERIENCE AREND AND MARTIN VAN DER MEER

Helping to launch pilots into work

When the van der Meer brothers found it impossible to help promising students from their flight training school into jobs, they decided the only solution was to start their own operation, and AIS Airlines was born

How did you first get into the aviation business?

Arend: In 1970, when I worked as a maritime officer and engineer. I then moved to the navigation department of KLM and from there into the aviation training industry, as an instructor.

Martin: In 1964, I was working with Philips as an engineer/technical designer. I became infected by Arend's aviation vision so we started Aeronautical Instruction Services (AIS Group) and the AIS Flight Academy in 2005.

How has your previous experience helped you in your current role?

A: In the maritime sector, things like navigation, meteorological knowledge and technical knowledge are of almost equal importance. At KLM, engineering technical knowledge prevailed; as an instructor, navigation and operation knowledge; and within the AIS Group, aviation knowledge.

M: In AIS, I am active in several roles. I gained experience as a group leader and engineer at Philips, skills I have honed in my role as accountable manager and aircraft engineer with AIS.

How is the flight training industry faring in Europe?

A: The focus is enlarged, not only the training itself, also the start of the career of the cadets. But the number of approved training organisations (ATOs) has been decimated, at least in the Netherlands, due to several reasons.

First, there was a crisis, resulting in a dramatic decrease of jobs



Arend (left) and Martin operate eight BAe Jetstream 32 turboprops, some on their own scheduled routes

for new pilots. Second, the European regulations for ATOs changed in such a way that it has become almost impossible for small ATOs to survive.

What advice would you give someone wanting to pursue a career as a pilot?

M: The most important thing is to choose a flight academy which can give you a reasonable opportunity for a first job. Without several hundred hours on a multi-pilot aircraft, it will be much harder to get a job as first officer.

Why did you decide to set up the AIS Airlines business?

A: Initially we tried to organise a kind of apprentice scheme for our students in co-operation with existing airlines. When this proved to be impossible, we had to create

“AIS Airlines will continue to grow its route network and expand its fleet with larger aircraft”

MARTIN VAN DER MEER

a means for our students to obtain the necessary hours. The only solution was starting an airline ourselves, so AIS Airlines began in 2012. Nowadays we operate eight BAe Jetstream 32 turboprops, some under wet lease for third parties and others on scheduled routes of our own in Germany and Switzerland.

What is your next venture?

M: Just as we did with the full mo-

tion Jetstream simulator, we have to create a stable group of airline operators for our Boeing 737 simulator, which we obtained from KLM while it needed a simulator bay for its 787 Dreamliner.

By doing so, we increase the job possibilities for our students. AIS Airlines will continue to grow its route network and, if possible, expand its fleet with larger aircraft. ■



Looking for a job in aerospace? Check out our listings online at flightglobal.com/jobs

If you would like to feature in Working Week, or you know someone who does, email your pitch to kate.sarsfield@flightglobal.com



TIME FOR
YOUR CAREER
TO TAKE FLIGHT

Start your job search today

flightglobal.com/jobs

AVIATION | AIRLINES | AEROSPACE



Flightglobal
Jobs

The key players in aviation rely on us for the most trusted, reliable and timely fleet data, intelligence and insight when they need it most.

Introducing Flightglobal Fleets Analyzer

One simplified, online platform designed with flexibility and built upon an unmatched level of quality data.

Find the next deal in aviation and quickly access the most comprehensive view of the global fleet anytime, anywhere.

Request your trial today.

Visit flightglobal.com/fleetsanalyzer

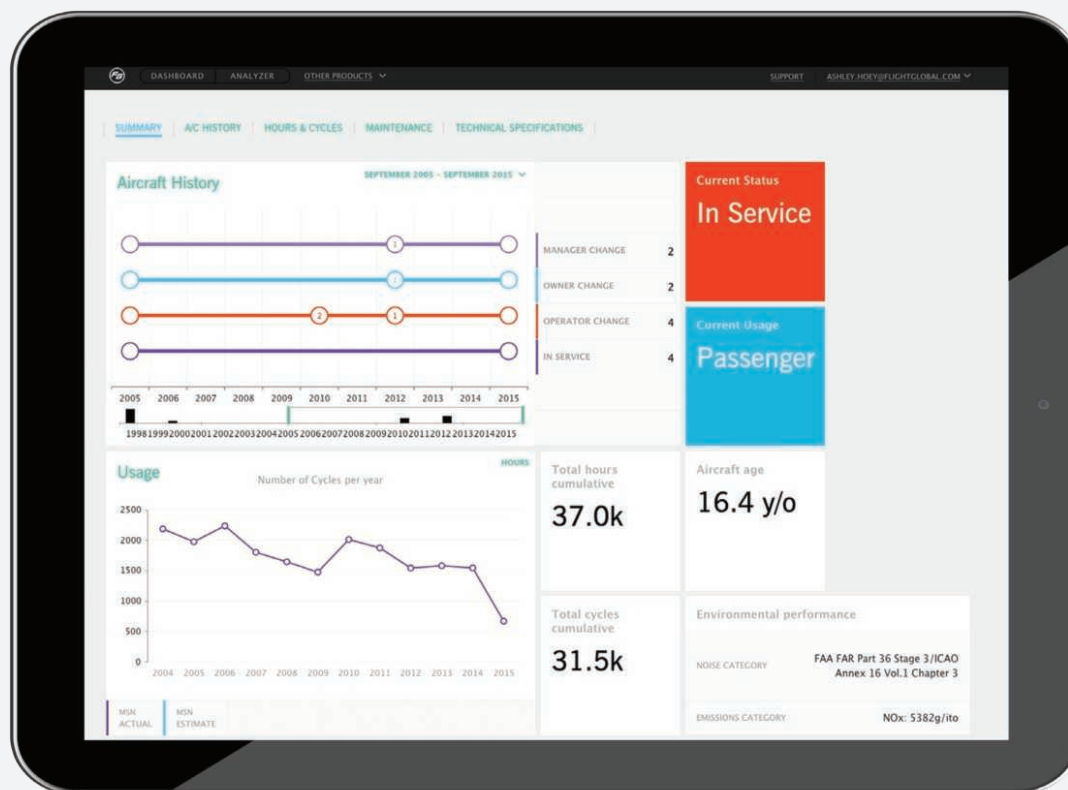


Illustration shows conceptual data only